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BLUE JAY

September 1996

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EDITOR'S MESSAGE

It is with pride and a measure of trepidation that I have agreed to become the editor of *Blue Jay.* In doing so, I follow in the footsteps of a line of worthy people who have created this magazine's fine reputation.

I cannot remember when I was not interested in natural history. I was given my first bird and mammal books in 1952 and I am sure this was in response to an already developed curiosity. I have, in the intervening years, been involved with several naturalist organizations in Sarnia, Port Hope and Ottawa, Ontario and Halifax, Nova Scotia. This included serving on a number of publications' committees, although this will be my first time as editor.

Through my experiences with the other newsletters and magazines I have already developed an editorial philosophy. I believe that a magazine should serve the people who pay for it. In the case of the *Blue Jay* I think this sentiment is captured precisely by the following quotation, "We have always tried to present material in the *Blue Jay* in an informal manner, just as if two or three nature lovers had got together and were exchanging experiences. At the same time we have always tried to present facts which are scientifically correct" (Isabel Priestly, 1944). The times have changed and I might not use the same words. For example, I have become less sure how to recognize the "truth" (or what is "scientifically correct") as I have become older. I think, however, the underlying attitude is timeless.

The members of Nature Saskatchewan and readers of the *Blue Jay* are nature lovers by heart, whose skills and interests vary widely. I believe that this magazine should reflect those skills and interests. I ask that you send your anecdotes, your poetry, your adventures and your observations to me for inclusion in our magazine. Do not worry about form or format. It is easier for me to receive items on disk, in WordPerfect, but I would rather you wrote on a used paper bag than let the opportunity slip to share with others something unforgettable. I can arrange for typing, editing and ensuring "correctness," but I cannot create the ideas, experiences and knowledge that you alone possess. Share them with me so that we can keep up the reputation of the *Blue Jay.* In particular, I want to encourage non-bird articles. While the SNS and other surveys show more people are interested in birds than in other sections of our flora and fauna, I would like to see a balance in our articles and have the opportunity to learn from a variety of people's observations.

There is another point I would like to share with you in my first editorial. I like to ask people to suggest a deadline that they can live with comfortably. I then hold them to that deadline and have been known to get uncomfortably "growly" if it passes without an understandable reason for their tardiness. To justify behaving in such a way, I, of course must meet my own deadlines!

Finally I would like to thank the many people who went to great lengths to help me pull this issue together. These include Stuart and Mary Houston, Frank Roy, Bernie Gollop, Curt Schroeder, Doug Collister, the reviewers and contributors.

Sincerely,

Roy D. John

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NORTHERN HAWK OWL NESTS AT WAITVILLE

LYALL M. HUNTER, Box 632, Birch Hills, SK. S0J 0G0

On 27 April 1969, when 10 years old, I watched a Northern Hawk Owl fly into the top of a broken-off aspen stub about 20 feet above the ground, in thick bush on SE13-45-24W2, one mile east of the hamlet of Waitville, or eight miles south and two miles east of Birch Hills. When I reported my find to Doug Whitfield and Dr. Stuart Houston, I met some incredulity, but I was certain of my identification and stuck to my guns. My identification was indeed correct.

On 10 May 1969, Houston and Whitfield visited the nest. Some new growth has formed over years since the tree broke in a storm. This has created a partial rim around the nest cup. When Whitfield, using spurs, had climbed halfway to the nest, the adult male Hawk Owl attacked him savagely, inflicting deep claw cuts before letting go and dropping to the ground; alert helper Arnold Nijssen quickly caught the male and banded it. When Whitfield reached the nest, which contained eight eggs, the adult female came close enough to be caught by hand, and was also banded. My letter was published in the Junior Naturalists section of *Blue Jay* 27:166, 1969. In mid-June, Whitfield returned to band the five or six young; one unhatched egg remained in the nest.

Mice, chiefly *Microtus*, were present in unprecedented numbers in 1996, reminiscent of the previous "Year of the Owls," in 1960 (Houston, *Blue Jay* 18:105-110, 1960). The three main mice-eating raptors responded by having more nests and more young than in any other year. Dr. Houston tells me that in this one exceptional year, 1969, he banded 152 Northern Harriers, 103 Long-eared Owls and 87 Short-eared Owls. For these three species they constituted, respectively, one-third, one-quarter and one-third of his lifelong totals over 54 years. He hypothesized that one pair of Hawk Owls that year similarly had responded to the plentiful supply of prey, and in their case nested farther south than usual, rather than returning to their normal habitat in the mixed forest to the north. It was presumed that this unusual range extension southward was a one-time phenomenon.

However, in 1976, Hawk Owls nested half a mile farther south (NE12-45-24W2). This time they used a Pileated Woodpecker hole in a Black Poplar, only about six feet above the ground. The number of eggs or young could not be ascertained. Further land clearing has taken place. There have been one or two fall and winter sightings in the twenty years since, but no more summer records.

P.S. During a fishing trip to Gord Kosolofski's Pilot's Lodge, two miles upstream from Brink Rapids on the Fond du Lac River with my youngest son, now 11, on 1-5 July 1996, we saw an active Golden Eagle nest with two young on a ledge on a 100-foot sandstone cliff, less than a mile upstream from the lodge, at roughly 59°02' North and 104°35' West. David Thompson had a nearly-fatal canoe trip on this river, from Wollaston Lake to Black Lake, and back, in 1796. Near Gord Kosolofski's fishing camp, Common Nighthawks seemed unusually common, and we flushed a Willow Ptarmigan with a brood of eight.

Gumbo Evening Primrose *Wayne Harris*

POSSIBLE SIGHTING OF ESKIMO CURLEWS (*Numenius borealis*)

BOB WALDON, Box 338, Alert Bay, BC. V0N 1A0

On 15 May 1996, Gwen and Lloyd Powell of Killarney, Manitoba, were out checking one of Lloyd's bluebird house lines south of town, tending to a hobby of some twenty years' standing. That spring having been a late and wet one, the sloughs were brimming and there were lots of meltwater ponds still sitting in pastures and fields.

At the time of the sighting they were at the south-east corner of SE8-2-17, two miles west of Highway #18, on Fletcher Road, five miles south of Killarney. It was a clear, calm day; the temperature was "comfortable."

Around 10:00 a.m. they got out of their car and were walking down a little-used road when Lloyd spotted three shorebirds at the edge of a meltwater pond just to the west of the road allowance. He said, "I have been observing birds for over sixty years. They caught my attention immediately because they were so different."

With mounting excitement the Powells slowly approached to within 25 or 30 m of the birds. The birds remained indifferent to their presence and went on with their busy feeding, allowing the Powells approximately half an hour to observe them under excellent viewing conditions, and for Lloyd to take notes. They both had binoculars, an 8x40 Bushnell and an 8x21 Tasco. The field guide they had was Peterson's *Eastern Birds*, 1980 edition.

When they returned home Lloyd immediately transcribed his notes into the following report (metrics added subsequently):

"All birds were similar in colour. In comparison to a Killdeer which was near and beside them these birds were larger, 11 to 14 inches (28-35.5 cm) in length, about 3.5-4.0 inches (9-10 cm) in body height. (Body height in this case is an estimate of the distance from the bottom of the breast to the crown of the head.) (The) Bill was about 2 inches (5 cm) long with a slight down curve at the end. The birds appeared to be about 10-12 inches (25-30.5 cm) in total height.

"The birds were mottled orangey brown, darker on back than front. Wing tips and tail were dark brown or black. Legs looked darker, maybe a dark grey. The head and beak were dainty, with light stripes and brown stripes on the head, light stripe over the eye.

"The birds were feeding in a shallow pond in a stubble field. They fed in the water, wading around, and seemed to pick insects off the water. They did not put their heads under water. They also picked up items from the shore at the water's edge and maybe a foot or two from the edge. They did not swim that we saw, but waded in shallow water at the edge of the pond. There were frogs croaking near us, but Gwen could hear a sound like 'dee, dee, dee.'

"These were birds that I have never seen before — I am familiar with Marbled Godwits, Willets, Whimbrels, and Yellowlegs. The description seemed to fit very well (with the illustration of the Eskimo Curlew in our field guide)."

Regrettably, the Powells had neither a film camera nor a video camera to record these birds.

The bird most closely resembling the Eskimo Curlew is the Little Curlew, *Numenius minutus*, a Siberian breeder recorded, as of 1993, only twice in North America. Both of these were autumn sightings in California, in 1984 and 1988 (Paulson, *Shorebirds of the Pacific Northwest*, 1993, p. 185).

The major field guides list the Eskimo Curlew as "nearly extinct," a classification that many in the birding community regard as optimistic. In the *Atlas of Saskatchewan Birds*, by Alan R. Smith, 1996, the Eskimo Curlew is categorized, sadly, as "hypothetical." According to Smith, the only recent record in Saskatchewan occurred near Regina on 14 May 1982.

The assumption that this once-abundant shorebird has gone the way of the Passenger Pigeon was firmly established in the public mind by the publication in 1955 of Fred Bodsworth's best-selling *The Last of the Curlews*, a poignant imaginary account of the life of the last surviving bird of its species.

Historically, Eskimo Curlews, which bred, or more hopefully, breed, in the high Arctic, followed a migration pattern similar to that of the Lesser Golden Plover — south down the east coast to their wintering grounds in southern South America, north through the prairie states and provinces. It was during their fall migration, past the market and pot hunters of the eastern seaboard, that they were gunned to virtual oblivion in the 1880s. These were the birds referred to in the game trade as "dough-birds" because of the layer of white fat encasing their bodies.

The only encouraging element in this sorry chronicle of human greed and indifference is the ongoing record of fortuitous sightings from widely scattered locations. One must hope they are valid, and if so that these remnant survivors may eventually be able to restore the multitudes that were devastated so brutally.

(*Editor's note: See Volume 52 No. 2 page 104 for another account about this endangered species*)

With the help of other systematists, I recently estimated the number of known species of organisms, including all plants, animals, and microorganisms, to be 1.4 million. This figure could easily be off by a hundred thousand, so poorly defined are species in some groups of organisms and so chaotically organized is the literature on diversity in general. More to the point, evolutionary biologists are generally agreed that this estimate is less than a tenth of the number that actually live on earth. *E.O. Wilson, 1992. The diversity of life. W.W. Norton and Company, New York. 424 pp.*

GREAT HORNED OWL NEST SITES IN SASKATCHEWAN

C. STUART HOUSTON, 863 University Drive, Saskatoon, SK. S7N 0J8

Note: The indulgence of the reader is requested for the use of imperial measurements of heights. It strikes me as foolish to convert estimates of nest height, begun before the introduction of metric measurements, into fractions of metres.

Owls and falcons do not build their own nests. We know that Prairie Falcons can be attracted to a new territory by a man-made hole in a dirt cliff. Although prey availability is the prime consideration,[5] my observations suggest that a beginning pair of Great Horned Owls similarly are more likely to choose a territory if it contains a sturdy Red-tailed Hawk nest; such nests may be even more attractive when remote from human activity. When owls are on the upward slope of their 10-year population cycle,[4] we see virtually no owls except at nests; during these years, non-breeding owls are either absent or extremely inconspicuous. At such times, we find owls using nests of poorer quality and nests closer to roads. Once a male owl has established his territory (it is the male that shows philopatry, the name given to a return to the same territory in subsequent years), then there is presumably greater pressure to make do with whatever nest site is available on the territory.

This retrospective study of my banding records was undertaken to determine the extent of variation encountered in Saskatchewan nest sites, concerning the species of tree, the height of the nest above ground, and, when known, the bird species that built the nest in a previous year.

Methods and Results

Of 2,923 successful Great Horned Owl nests, with brood size known, 53 were on man-made structures, and the remainder were in trees. I also have data on 11 additional tree nests, seven built by Red-tailed Hawks, two by Ferruginous Hawks and two by Black-billed Magpies, where at least one member of the brood flew and eluded banding, thus removing that nest from our list of regular nests from which brood size is calculated. The 12th additional site was a former Prairie Falcon hole in a river cliff south of Lucky Lake, from which at least one owl was fledged. We did not have a single nest on a broken-off snag, though such have been used in Saskatchewan by Barred Owls,[3] and are the source of nearly half the Great Horned Owl nests near Cincinnati, Ohio.[1,2] By the time of the banding visit, usually following strong winds in the preceding week or two, there were six instances where there was no evidence of the initial nest; the young were being cared for on the ground. In 102 instances, the species of tree was not recorded. The height of each nest was recorded, within 10% error, by comparing the nest height to the six-foot climber as he progressed up the tree, validated by intermittent use of a tape measure and optical measuring device, and by the fairly frequent use of a 20-foot sectional aluminum ladder. There are 2,746 nests for which height and tree

Table 1. HEIGHT ABOVE GROUND, SUCCESSFUL GREAT HORNED OWL NESTS

Tree Species	n =	height not recorded	# with height	Minimum height (feet)	Maximum height (feet)	Mean height (feet)
Ash	30	0	30	10	28	16
Aspen (live)	1,710	12	1,698	6	59	27
Aspen (dead)	143	0	143	10	44	24
Birch	2	0	2	29	40	35
Black Poplar	445	2	443	14	56	35
Caragana	1	0	1	7	—	7
Cottonwood	19	0	19	12	48	24
Elm	33	0	33	9	29	16
European Poplar	49	2	47	8	56	25
Manitoba Maple	205	0	205	8	38	19
Scotch Pine	12	0	12	8	34	19
Spruce	57	0	57	8	47	22
Willow	56	0	56	6	19	12
SPC electr. tower	1		1	—	70	70
Species Unrecorded	102					
Nest fallen down	6					
Total and Mean	2,871	16	2,746	6	70	25
Man-made Structures (no height given)						
Barn	39					
Granary	2					
Shed	2					
House	2					
Platform, box	7					
[SPC tower, above]						
Total nests	2,923					

species are known, and another 16 for which the tree species is known but height is not available (Table 1).

Identity of the species building the nest was known only when the territory had been visited in a previous year and the builder of the nest observed, or when owl finders visited hawk nests known from previous years to see whether a Great Horned Owl had taken over. Red-tailed Hawks were overwhelmingly the commonest nest providers for the owls; much less common use was made of nests built by the Swainson's Hawk, American Crow and Black-billed Magpie (Table 2).

Discussion

In Saskatchewan, Great Horned Owl nests in trees average less than 27 feet above ground, much lower than nests in Ohio[2] and Missouri (Henry B. Stuart, pers. comm.), where nests are rarely below 40 feet and sometimes exceed 100 feet above ground (Fig. 1).

Trees

Our highest tree nest was in a live aspen at 59 feet, while the lowest was at 6 feet (Fig. 2). Dan Neves has since found an owl nest in a Black Poplar, on the east side of Last Mountain Lake, that was 69 feet above ground in a sloping fork; we chose to leave the single young unbanded. Nests in Black Poplars had the highest mean height, 34.5 feet. Nests in willows averaged only 11.5 feet above ground; two were only 6

Table 2. OTHER-BUILT NESTS USED BY GREAT HORNED OWLS IN SASKATCHEWAN

Tree Species	Bird Species That Built Nest										
	Uncer.	RTHA	SWHA	AMCR	BBMA	COHA	FEHA	BRWA	NOGO	GBHE	Total
Ash	26		1	2	1						30
Aspen (live)	1,245	405	23	20	8	4	2	2		1	1,710
Aspen (dead)	120	18		3	2						143
Birch	2										2
Black Poplar	187	255	1	1					1		445
Caragana	0		1								1
Cottonwood	15		2	1	1						19
Elm	29		1	1	2						33
European Poplar	39	1	4	3	2						49
Manitoba Maple	175		3	11	13	1	2				205
Scotch Pine	9			2	1						12
Spruce	53			2	2						57
Willow	27		26	3							56
Unknown	101	1									102
Nest fallen down	6										6
SPC electr. tower		1									1
Total	2,034	681	62	49	32	5	4	2	1	1	2,871

RTHA - Red-tailed Hawk, *Buteo jamaicensis*; SWHA - Swainson's Hawk, *Buteo swainsoni*; AMCR - American Crow, *Corvus brachyrhynchos*; BBMA - Black-billed Magpie, *Pica pica*; COHA - Cooper's Hawk, *Accipiter cooperii*; FEHA - Ferruginous Hawk, *Buteo regalis*; BRWA - Broad-winged Hawk, *Buteo platypterus*; NOGO - Northern Goshawk, *Accipiter gentilis*.

feet above ground, within easy reach (Table 1). The three lowest nests were all in the southern third of the province, one in a live aspen in a ravine near Bulyea and two in willows west of Swift Current, in relatively open country.

Trees used most often were those occurring naturally in the parkland region of the province — Trembling Aspen and Black Poplar. Next were domesticated trees, led by the Manitoba Maple or Box Elder, followed by varieties of spruce, European poplar and elm (Table 1).

Throughout most of North America, as in Saskatchewan, Red-tailed Hawks are the usual builders of nests used in subsequent years by Great Horned Owls. Red-tail nests may be somewhat over-represented in my sample, because their nests are large and conspicuous, and because some finders began their owl nest search each year by visiting known hawk nests of previous years. Magpie nests may also be slightly over-represented, since they are easy to identify on the basis of structure alone; owls nest on top of magpie nests, or in the nest cup if part of the roof has disintegrated (Table 2).

Man-made structures:

Of special interest are the man-made structures. The most unusual location and our highest nest, 69.8 feet above ground, was on the arm of a tower on a 230,000 volt Saskatchewan Power Corporation electrical transmission line east of Saskatoon (Fig. 3). The original nest had been built on the tower cross-arm by a Red-tailed Hawk in 1979,

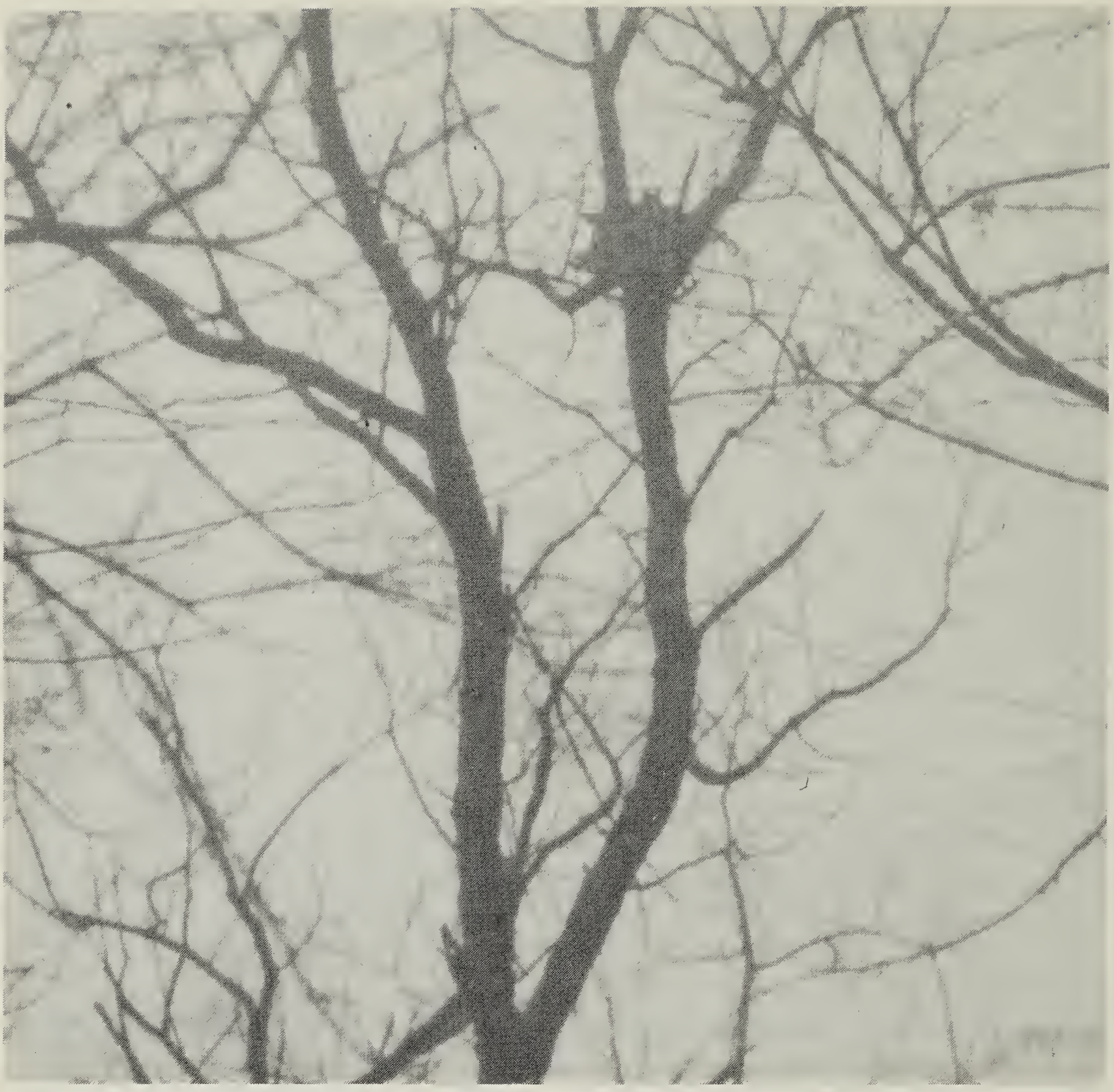

Figure 1. Great Horned Owl on nest, 65 feet above ground, Lee's Summit, Missouri, 4 April 1965. *Henry B. Stuart*

and was used again successfully by the hawk in 1980; we chose not to risk our lives to band nestling hawks. In 1981, however, when the owls took over the nest, we obtained the services of lineman Peter Sielski, Saskatchewan Power Corporation, who went with us on a sunny, warm day, and advised us to wear thick, dry gloves to combat the electrical current that hummed through all parts of the tower. Without Sielski's presence and good advice, bander Dr. Bill Barrie would have sat on the crossbar to band the single nestling and thereby would have placed his feet dangerously close to the high-tension wires.[6]

One nest north of Dilke was built on Wallace and Sharon Polsom's 3-year-old house (Fig. 4), which that winter happened to be unoccupied. The young owls were raised successfully even though the family visited the house frequently; the Polsoms did not take up residence in the house until after the owls had fledged. (Two of the three fledglings were electrocuted on the power transformer in the same yard that summer.) Another owl pair used the windowless attic of a long-deserted farmhouse west of Craik. Two used granaries, one laying its eggs on top of a slight hollow in a large pile of wheat.

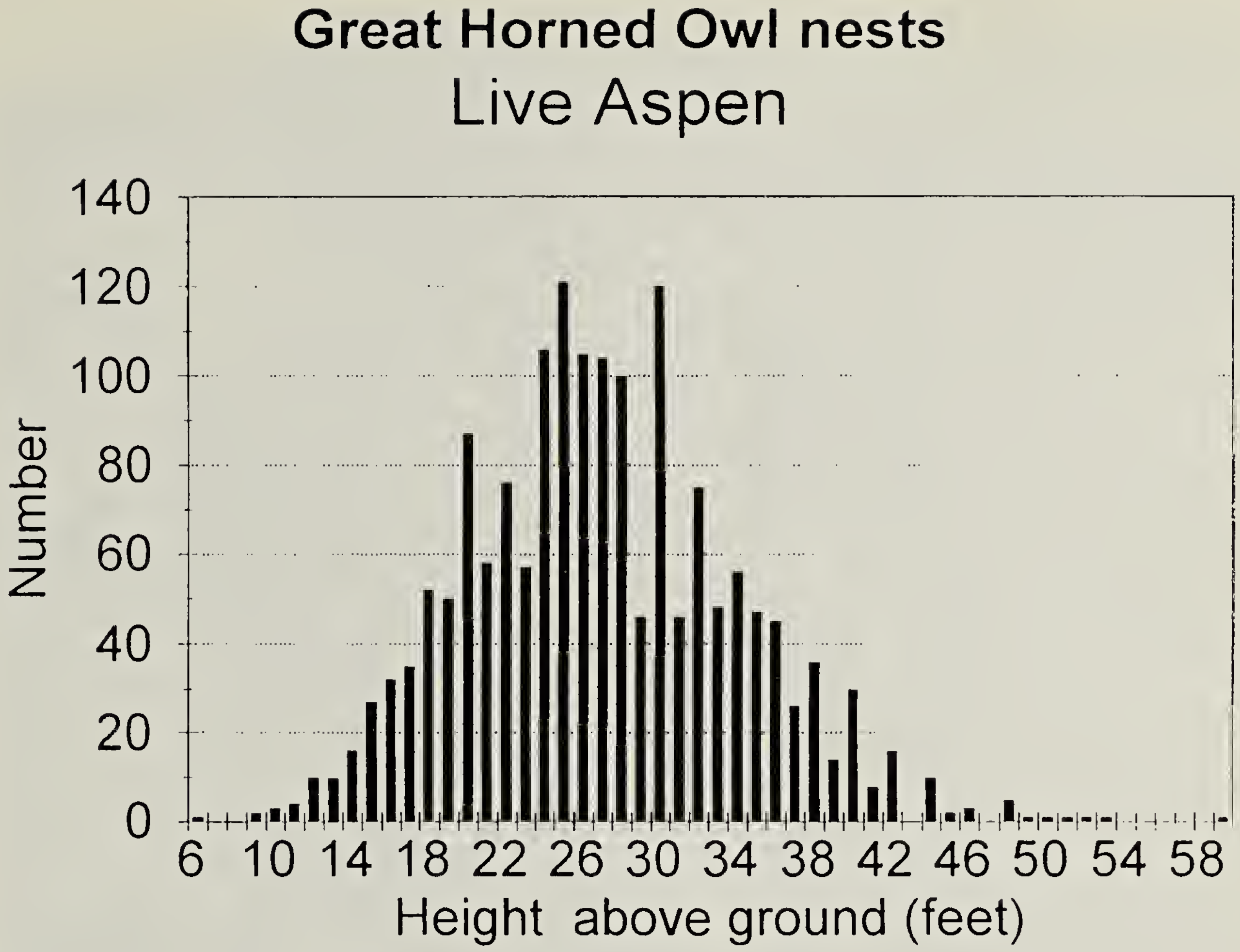

Figure 2. Graph to show distribution of heights of owl nests in aspen.

There were seven usages of boxes or platforms — but no use of the 12 platforms put up by the Saskatoon Junior Natural History Society in 1971 just as owl numbers were on their 10-year downturn. The platform built near Wynyard by the late Bob Gillard had an especially interesting story. A large aspen "bluff," south of the Yellowhead highway, had been used consistently each year for 40 years by Red-tailed Hawks and by Great Horned Owls. Rarely, the owl pair used the same hawk nest for two successive years, but more often the owl took over the most recent hawk nest, forcing the hawk pair to build a new nest or refurbish an earlier one. In late summer 1976, high winds blew down both the hawk tree and the tree used by the owl, so Bob Gillard placed a box, partly filled with sticks, 21 feet above the ground in a Black Poplar crotch. The owls took up residence and three young were banded in the box on 15 May 1977 (Fig. 5). After Bob's untimely death, his daughter, Shirley Norlin, and granddaughter Sharon Norlin, watched the box. In spite of new hawk nests available each year, the owls used the box on at least two further occasions, with three young banded on 25 May 1980, and 17 May 1981.

Other boxes or platforms were placed and used in Joe Plamondon's farmyard at St. Front, at Jane Pattison's at Lone Rock, and near Valley Centre by Wayne and Don Renaud. When a nest blew down on the golf course at Coteau Beach, Earl Brown put up a platform, with a large tire as its base. All of these fledged young successfully.

Barns formed the majority of man-made structure nest sites. A cupola with a broken window, high above the loft in the Hassman barn west of Cymric, just over a mile from the shore of Last Mountain Lake, was

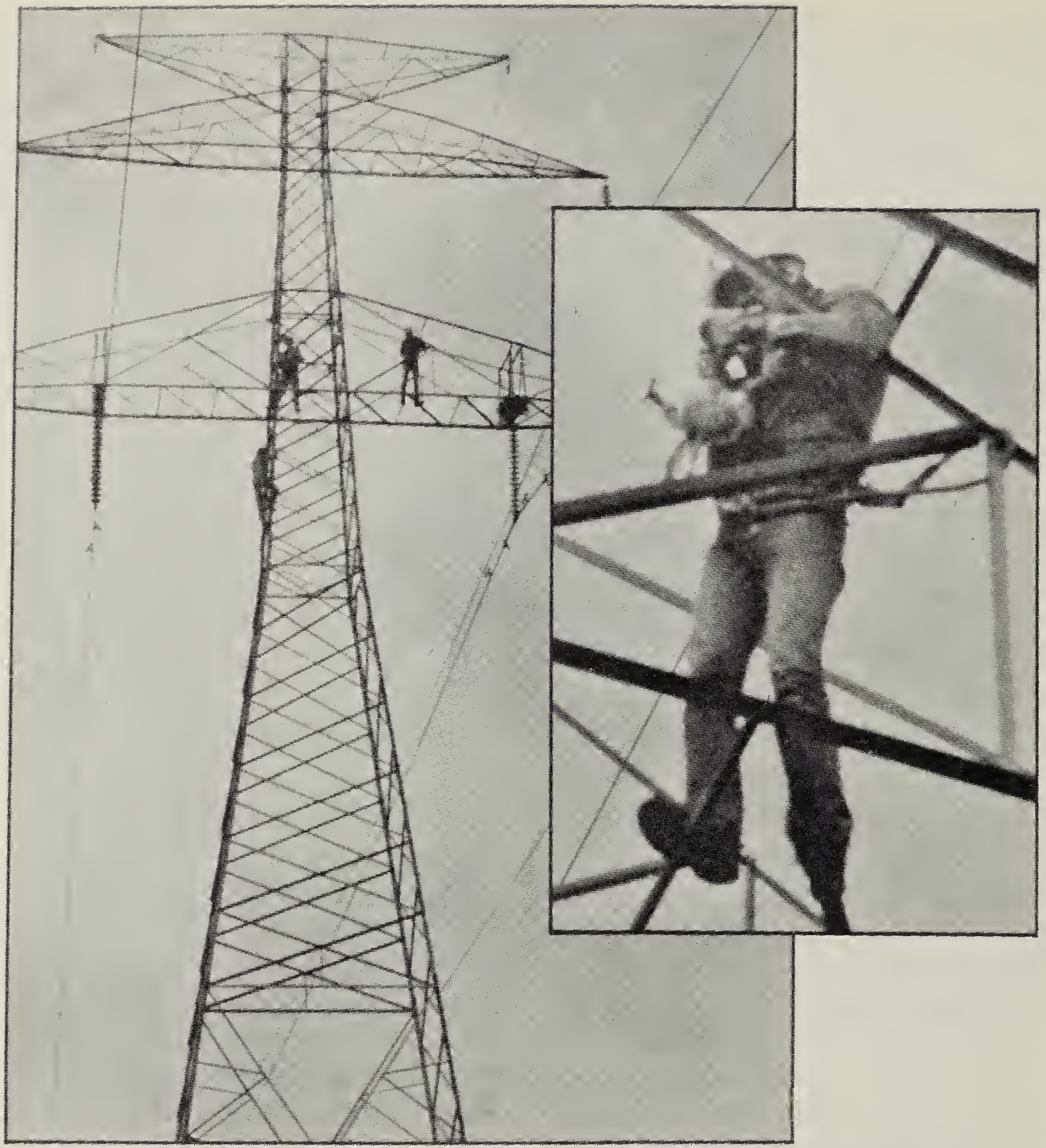

Figure 3. SPC Tower at time of banding of Great Horned Owlet, 12 May 1981 *Chris Escott*

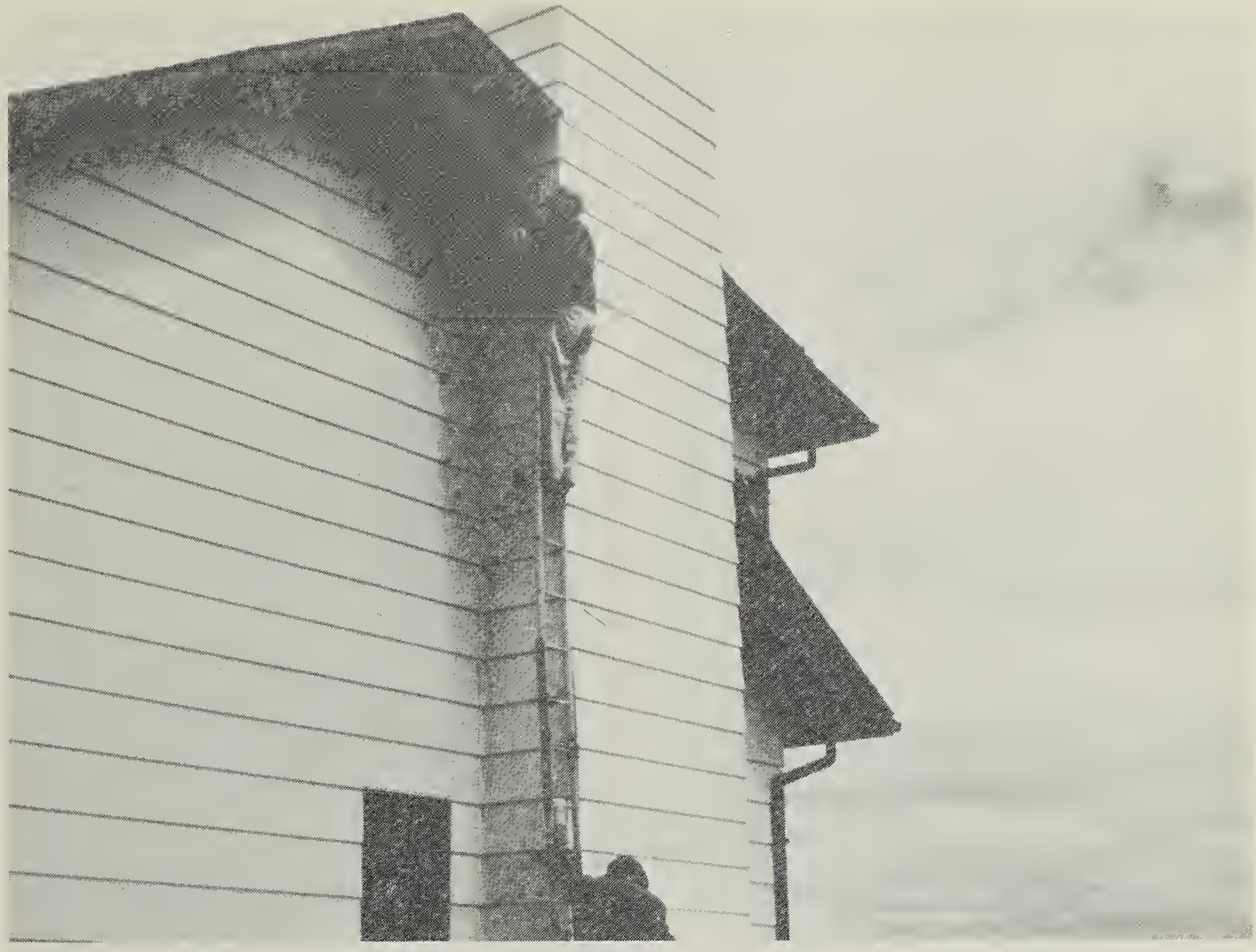

Figure 4. Owl nest on sloping lower roof segment (opposite Houston's head) on temporarily unoccupied Polsom house, north of Dilke, 13 May 1989 *Kelly Wylie*

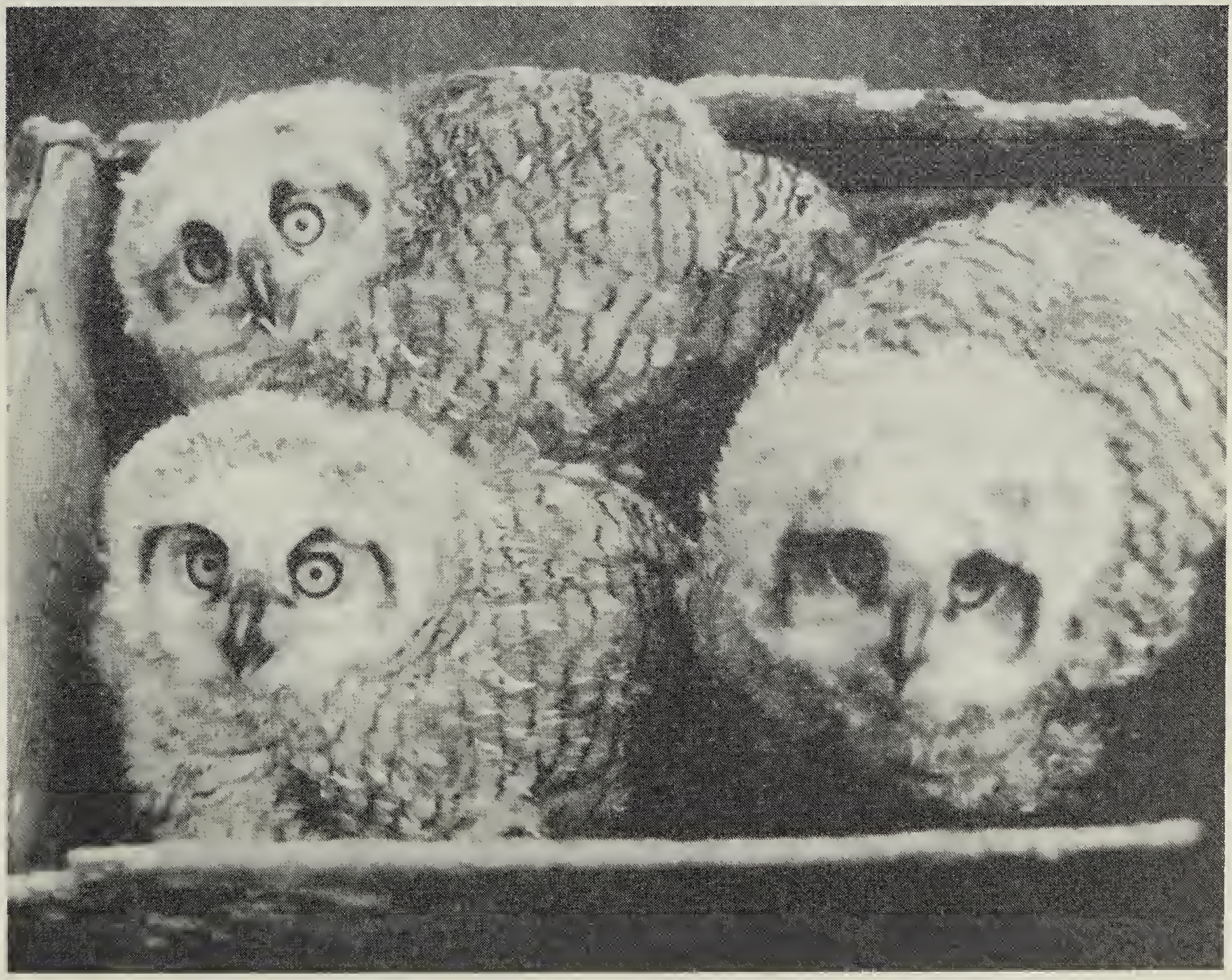

Figure 5. Three nestling owls in coop box, placed 21 feet above ground in black poplar, by Bob Gillard. 15 May 1977 *C.S. Houston*

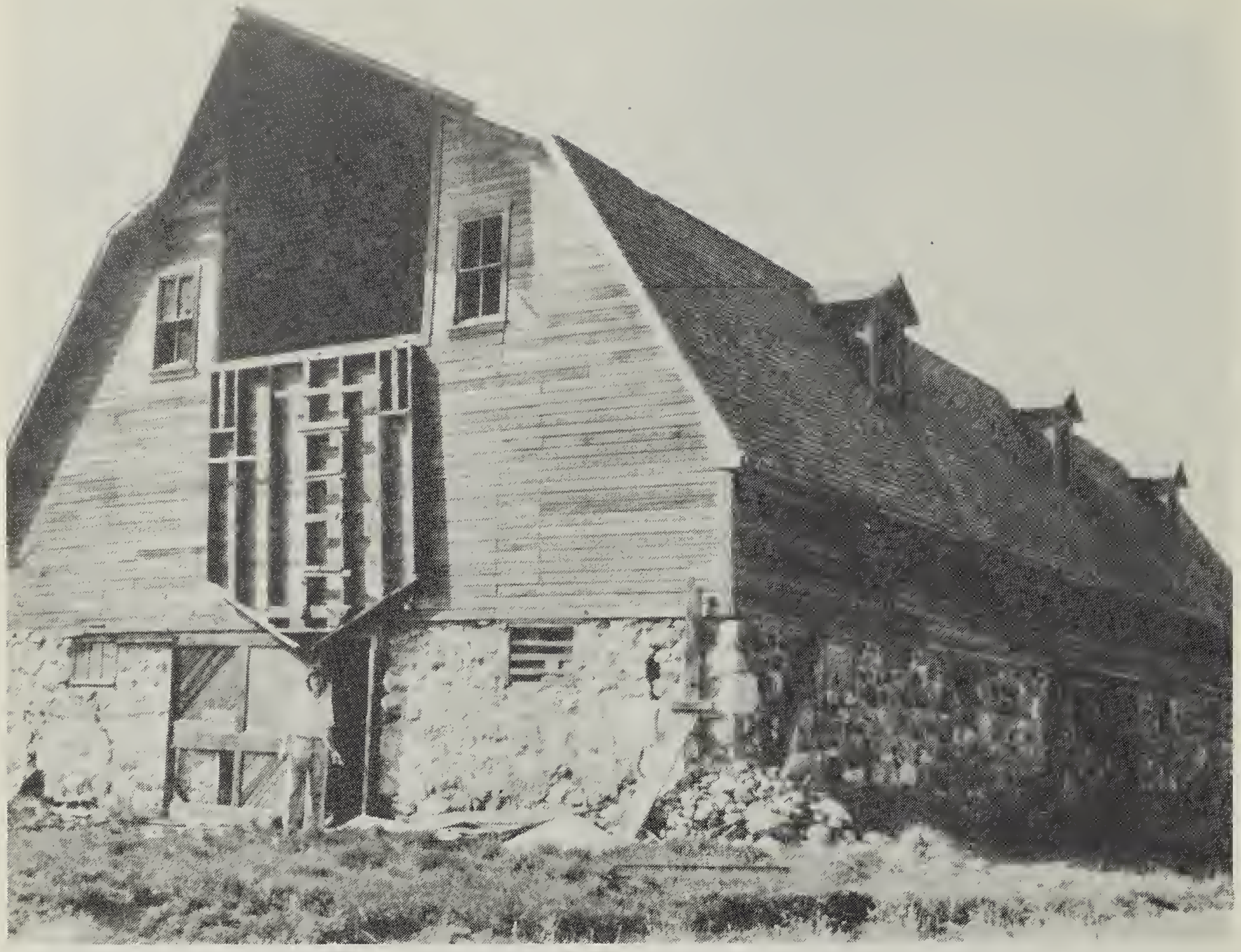

Figure 6. Hassman barn, west of Cymric (external view) *C.S. Houston*

used successfully by owls for at least 17 years: 1969-72 inclusive, 1977, 1979 and 1981-91 inclusive (Figs. 6 and 7). With large numbers of birds migrating north along the nearby eastern shore of the lake, these owls appeared well fed. During 17 attempts, all successful, the owls fledged 41 young, for a slightly-above-average 2.4 young per nest attempt. Raccoons moved into the deserted farmyard in 1992, and we suspect may have destroyed the nest and thus caused the owls to move away. A single owl was seen at the barn in the spring of 1996, but it did not nest.

Other barns near Laura and south of Biggar have been used in successive years. The Clark Jones barn west of Duval was used in two consecutive years. Owls were banded only once in barns near Aylesbury, Beechy, Bladworth, Carmichael, Conquest, Demaine, Eston, Raymore, Richlea, Saskatoon, and Skull Creek. A very old, low, log barn near Yellow Creek was only shed-height, so that one could reach into the nest in the "rafters." A nest in the hamlet of Isham was not in the barn building proper, but was wedged behind a formerly movable sliding loft door.

The Great Horned Owl, which often lays its eggs in the last week of February or first week of March, no doubt timed so that the young may be well fed on juvenile hares, is well served by not having to build a nest so early in the year. Of necessity, individual owls are extremely flexible in their choice of nest sites.

Acknowledgements

I wish to thank hundreds of owl nest finders over many years, and

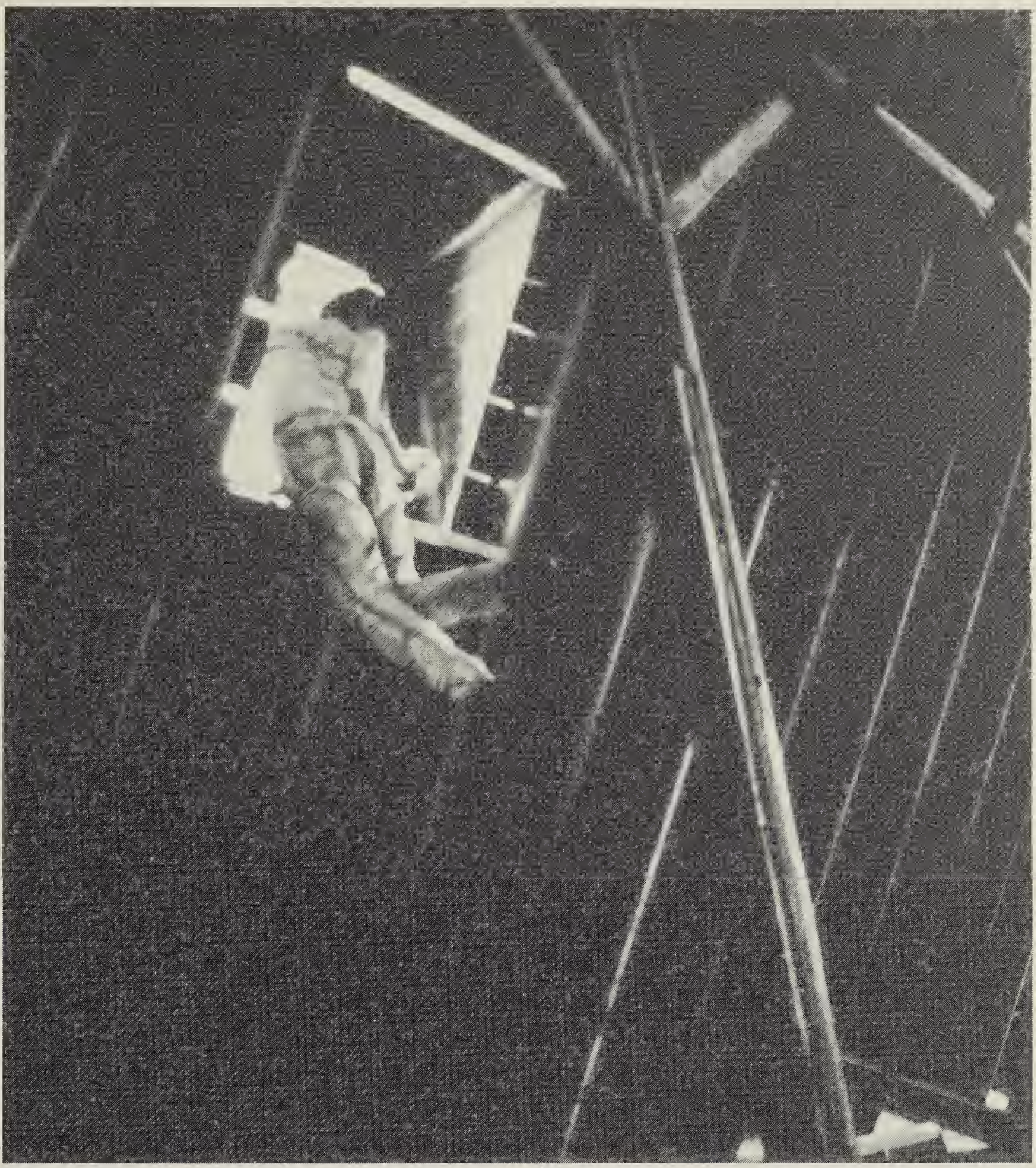

Figure 7. Interior view of cupola of Hassman barn *C.S. Houston*

the many helpers and climbers, too numerous to mention. An anonymous reviewer offered helpful improvements. Henry B. Stuart of Summit, Missouri, provided Figure 1.

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INTERMITTENT BIRDING AT PRINCE ALBERT, 1982-1985

DAVID H. WRIGHT, #1601 - 415 Heritage Crescent, Saskatoon, SK. S7H 5N3

Over 13 years I have recorded 95 species of birds in the Prince Albert area, some during short walks of 30 to 90 minutes near the Court House, some in the Little Red River Park along the north shore of the river, and some in the Spruce River wetlands 10 km north of the city along Highway 2. The most interesting observations were made at the latter marsh, especially where a concrete bridge spans the river on the service road paralleling the east side of the highway. Young of the Canada Goose, American Wigeon and American Coot were observed in the marsh, and a pair of territorial Northern Harriers dive-bombed me on 1 June 1994; they must have had a marsh nest nearby. The McCown's Longspur is an addition to the local list.

Observations of nine species were of special interest to me, they are as follows:

Merlin. An adult Merlin took a Red-winged Blackbird in the marsh just west of Highway 2 on 15 July 1991; later this bird perched on a telephone pole and plucked the kill.

American Avocet. On 22 May 1990 and again six days later, on the eastern side of the marsh, I located two nests on a mud flat. One had three eggs and the other, four. The incubating adults could be seen quite clearly from the service road and did not seem to be particularly concerned by the traffic. This a northernmost nest record for this longitude.

Common Snipe. Just northwest of the concrete bridge, I regularly heard on a summer evening, the eerie whinny made by air passing through the bird's feathers as it dives. A truly wonderful sound!

Cliff Swallow. Nests were present beneath the concrete bridge, on 22 May 1990 and 15 July 1992.

Marsh Wren. I have only one sighting, made at the marsh.

Red-winged Blackbird. On 16 June 1982, I made a thorough check of all the nests I could locate on either side of the service road. Three nests contained four eggs, one contained one egg, and another seven as yet had none. I was surprised by the variation in the number of eggs and in the total lack of any eggs of the Brown-headed Cowbird. Yellow-headed Blackbirds also had nests in this marsh.

McCown's Longspur. On 27 September 1983, in the shrubs near the federal court house, I spotted a small flock of four to five adults. This was a surprise. I was able to see the head markings, white throat and black triangle on the upper breast of the male. I presume they had wandered north of their breeding range before beginning their fall migration. This is a species not previously recorded in the area.

Pine Siskin. I had winter records at Red River Park, including 9 February 1990, 4 and 21 March 1989, and 14 March 1994.

A ONE-WINGED SAVANNAH SPARROW

ROBERT W. NERO, Wildlife Branch, Box 24, 200 Saulteaux Crescent,
Winnipeg, MB. R3J 3W3

Watching our Brittany spaniel running and circling about in an old hay field near our Winnipeg home in the evening of 30 August 1996, I suddenly realized that he had scented something in a patch of Red Clover. As he wheeled about, two or three sparrows flew up, perched close by, and a moment later flew off. It was then that our dog pounced and seized something; when I shouted, he dropped it, and I ran to see what he had captured. I was surprised to find that he'd killed a Savannah Sparrow fledgling, apparently one of a family group. The species is common in this meadow, but how had he managed to capture a fledged bird?

The dead bird was warm, the eyes were clear, and there was some fresh blood on the abdomen; it was also wet with saliva. The left wing was missing, and I assumed at first that the dog had bitten it off. Closer examination showed that the wing had been severed about halfway along the forearm, but it was an old injury. There was no blood and the distal end, or tip of the stub, was covered with clean bare skin that was slightly calloused. Later dissection showed that the shortened forearm was about half the length of the normal right one, 13 mm, as compared to 23 mm. The radius and ulna, two bones that comprise the forearm, lie close together. The distal end of the radius curved inwards and was joined to the severed tip of the rounded ulna by a bony bridge which seemed to originate from that larger bone. The bird was a male, with an unossified skull.

The wing could have been severed by some predator while the bird was still in the nest or shortly after fledging. However, the well-feathered and functional right wing, sound legs and feet, etc., and the bird's apparent good health, make this seem unlikely as the cause. The presence of three newly emerged secondaries on the shortened wing was puzzling. The bird could have been hatched with an abnormally short forearm, or, and this seems more likely, it sustained an injury when emerging from the egg. Either way, given the nature of its handicap, the survival of this individual to the fledgling stage seems remarkable.

Although only a minor observation, this provides another example of the strong healing power and tenacious nature of birds. I am reminded of reports of several ducks, including a Mallard and Blue-winged Teal, that had survived the loss of an entire wing prior to being taken by hunters.[1,2]

1. Caskey, R.D. 1950. One-winged duck. *Blue Jay* 8: 28.
2. Nero, R.W. 1960. One-winged ducks. *Blue Jay* 18: 76.

EXPERIENCE WITH BURROWING OWL NEST-BOXES IN SASKATCHEWAN, WITH COMMENT ON DECREASING RANGE

C. STUART HOUSTON, 863 University Drive, Saskatoon, SK. S7N 0J8;
DALE G. HJERTAAS, 15 Olson Place, Regina, SK. S4S 2J6; R. LORNE
SCOTT, Box 995, Indian Head, SK. S0G 2K0; and PAUL C. JAMES,
Department of Environment and Resource Management, 3211 Albert St.,
Regina, SK. S4S 5W6

Numbers of the attractive, long-legged little Burrowing Owl, *Speotyto cunicularia*, have been declining continuously in Saskatchewan for about 20 years. We wish to share our experiences, both successful and unsuccessful, in supplying nest-boxes in an attempt to help them.

Saskatchewan Nest-box Successes

The Saskatchewan success story began in 1983 when a golf driving range, constructed near the Heritage Inn in Moose Jaw, posed a threat to a colony of Burrowing Owls. While cultivating and levelling the land for this new purpose, the owners inadvertently filled in the entrance to an underground Burrowing Owl nest-hole. Although the young owls were already making forays out of this hole, they kept returning to the filled-in entrance. George Davies noticed the predicament of the owls and reopened the hole, only to have it filled in again. George and his friend, Hugh Somers, both members of the South Saskatchewan Wildlife Association, again opened the hole, put yellow stakes around it, and notified the driving range manager who was apologetic for failing to notice the presence of the owls. The owls immediately returned to the hole and used the stakes as hunting perches.

George learned of Burrowing Owl box projects in California, and wrote to obtain Collins-Landry plans from the Department of Natural Resources in Sacramento.[2] George and Hugh constructed two boxes and placed them in safe spots about 60 m from the threatened nest. Within hours the burrowing owls inspected these new accommodations.

Encouraged, George and Hugh placed nest boxes on the adjacent Lynbrook Golf Course, where George was an active member. Owls were nesting there in natural holes on the fifth fairway. Two nest-boxes were placed in the rough, and in the late fall the natural holes on the fairway were filled in. In the spring of 1984 owls moved into the nest-boxes.

Each nest-box had a screwed-on roof and was placed near the surface under a square of easily lifted sod, thus allowing easy access for banding young — not possible in natural badger holes where the owl young are often 1 m below the surface. One of us (Scott) began banding young Burrowing Owls in the Moose Jaw nest boxes in 1984.

The Saskatchewan Natural History

Society was quick to recognize the ground-breaking (!) achievements of George Davies, who was awarded, in absentia, with the society's Conservation Award for 1984 at the annual meeting in Melfort that year.[9]

In 1985, Grant and Sheila Fahlman, farmers near Kronau, 25 km east-southeast of Regina, were planning to sell their cattle and break the pasture for growing wheat. Lorne Scott and Dale Hjertaas, recognizing the importance of the colony of Burrowing Owls on the Fahlman pasture, arranged for payment of an annual fee to maintain the land as pasture with its owl habitat; financial assistance came from the World Wildlife Fund of Canada. This was the first-ever organizational agreement in Saskatchewan to protect a Burrowing Owl nest site.[11] In August 1985, Hjertaas and Scott installed 12 nest-boxes on this pasture.

Each year, most Burrowing Owls used boxes instead of the natural badger holes and fledged at least an average number of young per nest; a wooden, right-angle tunnel made access more difficult for predatory badgers and foxes.

The Fahlman pasture was an ideal site for H.R.H. Prince Philip, on tour with the World Wildlife Fund, to visit on 4 June 1987, when the first young owls of the season were just big enough to band; an event covered by national media. This was the day before the official ceremony at Last Mountain Lake, celebrating the 100th anniversary of North America's first migratory bird sanctuary.[13]

By 1992, there were 126 nest-boxes in place at 41 sites. Through 1993, Scott banded 417 nestling Burrowing Owls at Moose Jaw and Kronau. Through 1991, Hjertaas banded 139 nestlings and four adults in boxes in the Avonlea, Milestone and Moose Jaw areas. As yet, there have been no recoveries from the wintering grounds, presumed to be in Texas and/or Mexico.

Saskatchewan Failures

In 1987, Houston and his crew thought they should try to help a small colony of five pairs of Burrowing Owls that had for several years occupied the south border of the Kindersley-Elna Prairie Farm Rehabilitation Administration (PFRA) pasture, south of Smiley, Saskatchewan. On 25 October, with the permission of Jim Hoffman, pasture manager, six boxes were dug in. A single adult, late to migrate, was still on site. Four boxes were placed, each within 5 m of a hole occupied earlier that year within the main colony. One was placed on the summit of a small rise 100 m to the east, and one near a separate occupied hole south of the corral, about 200 m distant. Patsy Hoffman, Jim's wife, and sons Steve and Michael came to watch David Miller, Stuart and Mary Houston and Dylan von Kuster constructing and digging-in the prefabricated components supplied by Dale Hjertaas of the Department of Natural Resources (now the Department of Environment and Resource Management), Regina. Great was our disappointment when not a single box was occupied in 1988 or subsequent years (although another colony was later located 10 km farther north, east of the pasture headquarters, with 18 pairs in 1991, 9 pairs in 1992 and 2 pairs in their final year of occupancy, 1993).

In 1988, highway construction unearthed an active Burrowing Owl nest along highway 44 immediately west of Eston. Houston was asked for advice and referred the highway crew to Hjertaas. Since a fenced-in Department of Highways' compound was just across the ditch to the south, an artificial box was placed within the compound by Craig Palmer and John Pollock.[10] Not only did the owls take over care of the young in the new location, but subpermittee Martin Gerard was able to go to Eston on 11 July and band seven healthy young in the box. Martin found a larder of three uneaten deer mice in the box, and hundreds of fleas. Soon thereafter the pair moved their young to a nearby badger hole, and on 25 July one of the adults was killed by a car on Highway 44. The next day, one of the banded young was run over on the same highway, less than 100 m from the badger hole. This success was short-lived; the Eston pair failed to return in 1989 and subsequent years.

In the fall of 1988, Hjertaas sent Houston prefabricated components for five more boxes. On 9 October, after obtaining permission, two boxes were dug in at the two-pair colony on John and Barb Lypka's pasture, within sight of their home north of Rosetown, and on Stuart Hanson's pasture north of Tessier. On the Lypka pasture a single adult was still present. Our crew was David Miller, Cathryn Miller, Nigel Mathews, Cecily Grant, Dylan von Kuster and Jill Hocken. On 16 October David Miller, Kelly Wylie, Martin and Silvia Gerard, with much help from pasture owner Bert Bentley, dug in two boxes at a two-pair site on the edge of the hamlet of Clavet.

Boy Scouts with Hjertaas similarly dug in ten boxes at the Walter Bedford pasture near Avonlea in 1987; one box was used in 1988, with seven nestlings banded. The remaining boxes were ignored or filled in by ground squirrels. Two boxes near Condie and two near Saskatoon had a similar fate.

The Houston effort of placing nest-boxes to help this declining species has come to naught. Not one box has been occupied and no owl pair has returned to use the adjacent active badger hole burrows, which in each case had been in use just months before the installation of artificial boxes. Our best guess is that by chance we chose sites where, for some unknown reason, the owls did not survive their winter migration to and back from Texas or Mexico. Judging from experience at the Walter Bedford farm at Avonlea, ground squirrels may have filled some of the box entrance tunnels with dirt. Since the process has been of help elsewhere, it is difficult to imagine how our intervention could have had any detrimental effect the following season.

Decreasing Range and Numbers North of South Saskatchewan River

Burrowing Owls have nesting habitat requirements of short grass, open sites, and badger and ground squirrel burrow availability.[3] In their heyday, Burrowing Owls were known to use much smaller stretches of pasture, including grassy strips along railroad right-of-ways in the midst of otherwise fully cultivated land. Near Eston, in 1960, the late Bill Richards, a railway employee, counted 17 Burrowing Owls along 46 km of right-of-way radiating in three directions in intensively farmed areas surrounding Eston (pers. comm.). In Saskatchewan, Burrowing Owls once nested sparingly as far north as the parklands and even to the southern edge of the mixed forest. A single pair nested at Livelong, 53° 27'

North, in 1943,[12] and another pair bred at Nipawin, 53° 22' North, in 1940.[6] The range is now shrinking, and the numbers are declining. In spite of each owner's care and concern, 68% of the Operation Burrowing Owl pastures that were occupied in 1986 were unoccupied by 1993.[5]

Burrowing Owls like to use the edges of large PFRA pastures, where there are fences to perch on — commonly near to roads where some of the young are killed by passing cars, as noted first in the Dakotas by Brenckle in the 1930s.[1] The long-term use of the nine pastures within the Kindersley 1:250,000 [National Topographical Service] map sheet, 51° to 52° and 108° to 110°, has declined drastically. The northernmost recent site, the Heart's Hill PFRA pasture, 51° 55' North, along the Alberta boundary south of Cactus Lake, has not had a breeding pair since 1985. Pasture manager Joe Kohlman notes that the disappearance of the owls coincided with increased use of grasshopper biocides, particularly carbofuran, just outside the pasture, providing anecdotal support to previous studies of the harmful effects of carbofuran.[8] More surprisingly, not one has been seen in the Antelope Park pasture since about 1980 (Doug Young, pers. comm.).

At the Mantario (four pairs) and Hillsburgh pastures, Burrowing Owls disappeared about 1986 (Paul Moffenbauer and Lise Larson, pers. comm.). At Eagle Lake pasture, north of Netherhill, there were five pairs in 1990, with the last pair seen in 1993 (Ed Koch, pers. comm.). At Newcombe pasture, south of Glidden, in the early 1980s there were three different sites with six, four and three pairs, but none have been present since 1990 (Lloyd Dowd, pers. comm.). At Progress pasture, west of Kerrobert, there were one or two pairs near Beloil Lake until 1993 or 1994, but none since (Bill Meek, pers. comm.). The Mariposa pasture, east of Kerrobert, had a declining population until there was only one pair found in 1993, only an apparently unmated singleton in 1994, one pair in 1995, the year two were found drowned in a water-trough just east of the headquarters (Wendell Roszell, pers. comm.), and one pair in 1996, the only pair located by Houston in any PFRA pasture in 1995 or 1996. Outside of the government pastures in 1996, a small colony of three pairs persisted south of Plato (Hazel Fors, pers. comm.), one pair near Laporte (Jean Harris, pers. comm.), and a probable pair near Cabri Lake (Dean Francis, pers. comm.).

On the Rosetown map sheet (immediately east of the Kindersley map sheet), where Wedgwood had 25 sites in 1975,[14] at least four sites were active in 1996: three pairs on Harvey Lonsberry's pasture east of Wiseton, a single pair known near Ardath in a pasture locally unusual for its persisting high numbers of Richardson's Ground Squirrels; one pair in a pasture on highway 45, east of Conquest (Marion Deschamps, pers. comm.), and one pair within a mile west of the Gardiner Dam (Frank Roy, pers. comm.). East of Highway 4, from Rosetown to Kyle, owl numbers were already in decline by 1975.[14] This decline had accelerated throughout most of southern Saskatchewan by 1992.[7] Southwest of Kyle, on the Prelate map sheet, one pair returned to a long-term site on the Tritten pasture in 1996, but apparently raised no young.

Sadly, the provincewide Operation Burrowing Owl program of posting and protecting land[4] has been insufficient to stay the downward trend of this vulnerable species. Local supplemental feeding in an experimental study area (T. Wellicome, pers. comm.) may prove more successful. If the obvious, widespread decline of this interesting species cannot be slowed or even reversed, total extirpation from Saskatchewan may be closer than we care to think.

Acknowledgements: Jim Wedgwood kindly provided a breakdown of Burrowing Owl numbers on the east and west sides of the Saskatchewan River. We thank Jim Duncan for constructive criticism.

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MUSTARD, SPIDERWEB, PUDDLES, COMMA AND DRAGONFLY

BERNIE GOLLOP, 2202 York Ave., Saskatoon, SK. S7J 1J1, and MIKE GOLLOP, 51 Welker Cresc., Saskatoon, SK. S7H 3M3

In the course of butterfly and dragonfly surveys in southwestern Saskatchewan from 1 to 4 July 1996, we made the following mini-observations.

Mustard: An exceptionally thick band of mustard stretched for maybe a mile at water's edge along the south shore of the South Saskatchewan River west of Highway 4 in Saskatchewan Landing Provincial Park on the 1st. Because butterflying had been poor along the trail, BG decided to check the mustard, not noted as butterfly habitat. However, just over an hour in three patches of this sun-drenched stand of yellow we turned up nine species: 10 Western Whites, 8 Common Ringlets, 5 Common Checkered and 2 Garita Skippers, 4 Milbert's Tortoiseshells, 3 Purplish Coppers, 2 sulphurs, a White Admiral, and, most surprisingly, that denizen of shady aspen groves, a Mourning Cloak, feeding leisurely from one flower to another.[1]

Spiderweb: On the 2nd, beside the Cypress Hills Provincial Park (CHPP) lagoon, was a seemingly perfect orb web about 2 ft. above the ground but, instead of being in the usual vertical plane, it was horizontal — perfectly horizontal.

Puddles — at least some puddles — are well known as butterfly habitat. One on the trail of a logged opening on the Boiler Creek Road, CHPP, attracted seven species in about 30 minutes on the 2nd: White Admiral, Greenish and Western Tailed Blues, Meadow Fritillary, Western Pine Elfin, skipper, sulphur and crescent. There were never more than six butterflies sipping the mud at one time. On the same day, where Boiler Creek flowed shallowly across the road, there were at least 15 crescents, 3 Greenish and 4 Western Tailed Blues at 3 p.m. But the best Cypress Hills puddle we have found was on 15 August 1995 where the west road crosses Sucker Creek. In a 10-minute period, we saw 11 species: 15 Meadow, 10 Mormon and 2 Titania Fritillaries, 2 crescents, 2 Peck's Skippers, and singles of Mustard White, Mourning Cloak, Satyr and Green commas, Common Wood-Nymph and ringlet.

Comma: Along Belanger Creek, CHPP, on the 2nd, MG noted a particularly territorial Satyr Comma: I first spotted it chasing a Mourning Cloak back and forth along a cutline in the coniferous forest. The comma then landed on a branch about 8 ft. up in an aspen. Almost immediately it spotted me and fluttered around my head, suggesting I shove off. Deciding that wasn't working, he returned to his perch but only briefly. Again he saw the Mourning Cloak and was off. In a few minutes, it returned to its branch but not before repeating its earlier message to me which I finally got. If the 10 minutes I watched was any indication, this butterfly had a stressful and strenuous day.

Dragonfly: In attempting to catch dragonflies to identify them at Loch Lomond, CHPP, on the 4th, BG spent his time missing nearby individuals. After one unsuccessful swing, the dragonfly in question backed off about a foot beyond the net, hovered and seemed to ask: "Got any better ideas?"

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1. Butterfly names are from NORTH AMERICAN BUTTERFLY ASSOCIATION. 1995. Checklist and English names of North American butterflies. Morristown, NJ. 07960

POETRY

Yr Wylan (THE SEAGULL)

The fair seagull on the tide,
The very same colour as snow or
moonlight,
Your fairness is spotless,
A scrap like the sun, glove of the sea,
You are light upon the ocean wave,
Swift, proud fish-eating bird!
Go there by the anchor,
Hand in hand with me, sea-lily.
Like a bright-looking letter,
You are a nun upon the sea-tide.

Girl's praise, she'll have far praise -
Go to the bend of wall and castle,
Look if you can see, seagull,
That Eigr on the bright wall.
Say my acceptable words.
May she choose me! Go to the girl.
If she's alone, be bold to greet her,
Be clever with the delicate girl,
To win her. Say I'll not
Live, a gentle fellow, unless I have her.

I love her, cause of all passion.
Oh men! Never did smooth-mouthed
Merlin
Or Taliesin love one more lovely than her,
Cypress-like, fought for, under copper
hair,
Most beautiful, too proper!
Oh seagull, if you see
The cheek of the loveliest girl in
Christendom,
Unless I have the sweetest of greetings,
The girl will be my end.

DAFYDD AP GWILYM (fl. 1340 -70)
translated from Welsh by Twym Morys

THE ROLE OF THE AWN IN THE MOVEMENT OF SEED OF THE WILD OAT

M.V.S. RAJU and W. CHAPCO, Biology Department, University of Regina, Regina, SK. S4S 0A2

The loose inflorescence (flowering shoot) of the wild oat (*Avena fatua L.*), an introduced annual weed, bears a large number of spikelets (Fig. 1A). In each spikelet, 2-3 florets (flowers) or occasionally more are developed, each bearing an awn. The awn is elongated and straight in a young floret (Fig. 1A). In a mature seed-bearing floret, on the other hand, the awn is changed into an angular or bent form (Fig. 1B). The awn has two parts to it, a basal thicker and shorter part called the awn and a terminal thinner and longer part, the awl (Fig. 1C).[4] The bent awn responds to moisture in the environment and changes to a straight condition. In the advent of dry conditions, it can revert to its bent form (Fig. 1C). This change of form is brought about by the mechanical twisting and untwisting of the basal part of the awn. In other words, if this part remains untwisted, the awn would remain straight, and if it is twisted then the entire awn would become bent; the latter type is obtained after water loss (Fig. 1C).[4] The awl, which does not twist nor untwist, on the other hand, remains straight in both wet and dry conditions. However, it can act as a lever during the twisting and untwisting of the basal part of the awn, thus helping in the crawling or rolling movement of the seed.[2,3,5]

Since the time of Darwin's[1] report on twisting and untwisting of the awn in response to moisture and grass seed movement there prevails a frequently implied view that the functionally active awn serves to drill the grass seed into an unbroken soil surface.

Unfortunately, there is no experimental evidence to support this view. Some observations and experimental results indicate that the surface movement (two-dimensional) of the active awn propels the seed into cracks or crevices in the soil surface.[2,3] In addition, as experimentally demonstrated, a more important function of the hygroscopically active (capable of movement in response to available moisture) awn is to dislodge the seed from the parent plant.[5,6,7]

The untwisting (leading to the straight condition) and twisting (leading to the bent condition) of the awn and the awl acting as a lever would make the seed crawl or roll on the ground. Such a movement results in a net displacement from the point where it started; also, a particular pattern of movement is revealed (Fig. 1D). Experiments were conducted to determine the pattern of movement during one cycle of untwisting and twisting of the awn, and to determine the total distance travelled by the seed and the actual distance accomplished. In addition, the importance of the length of the awl with respect to the pattern of seed

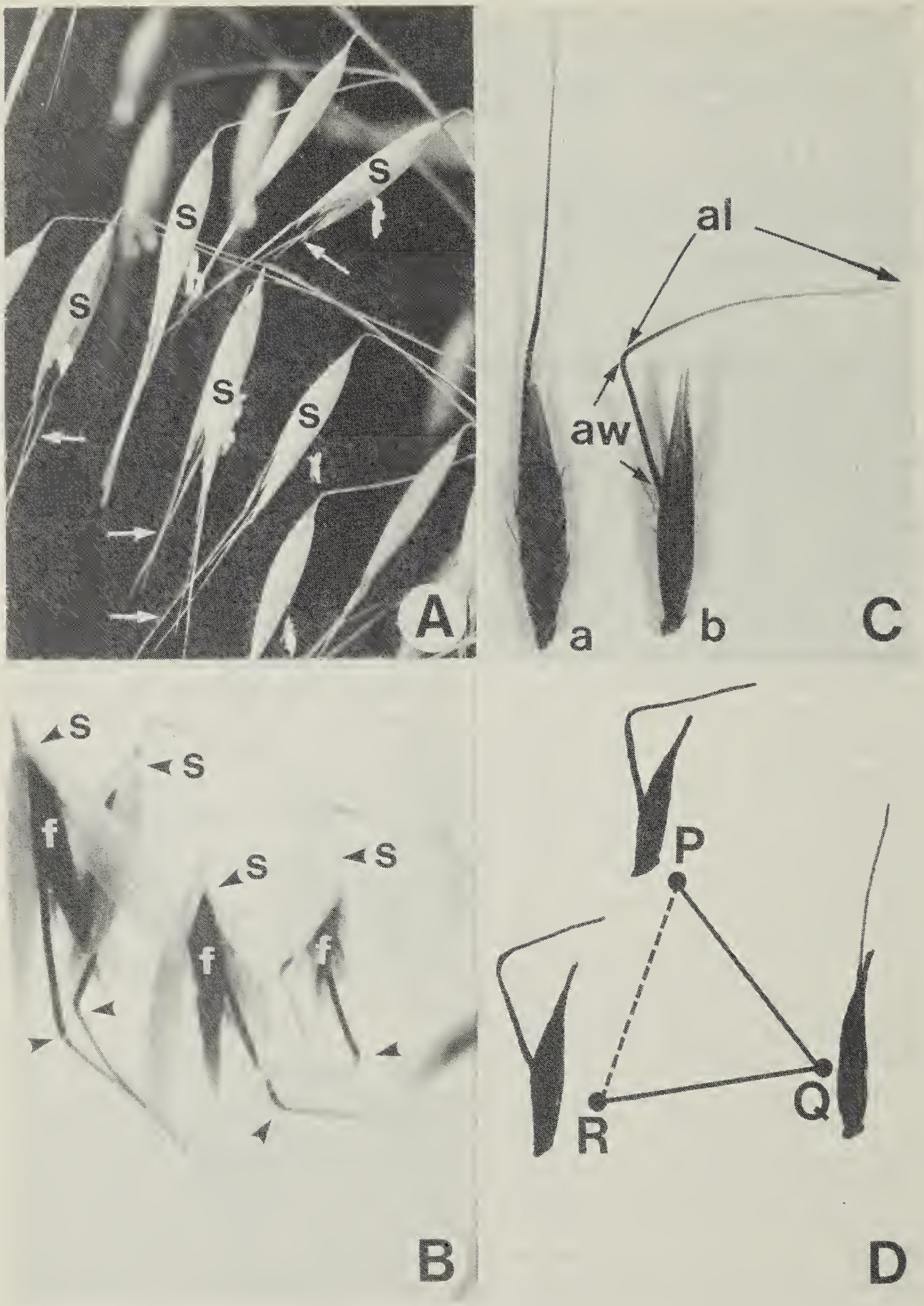

Figure 1: Spikelets, young and old, and seeds of Avena fatua L.
A) Young spikelets (s) in an inflorescence. Arrows indicate straight (young) awns, x1.
B) Older spikelets (s) with attached florets(f). Arrowheads point at the bent awns, x1.
C) Water-imbibed seed with its straight awn(a) and the dry seed(b) with its bent awn(aw)and awl(al),x1.
D) Diagram showing the form of the seed and the pattern of seed movement. P to Q is travelled distance of seed caused by the untwisting of awn. Q to R is the travelled distance of seed caused by the twisting (drying) of awn. P to R (interrupted line) is the actual distance accomplished in one cycle from the point of origin P.

Table 1. DETAILS TO SHOW THE EFFECT OF AWN LENGTH ON THE DISTANCE (MM) COVERED BY THE SEED WITH ITS AWN, CHANGING FROM BENT TO STRAIGHT CONDITION (EQUIVALENT OF ONE CYCLE)

Awl (distal part of awn) length	Awn (proximal part) length	Total distance travelled (P to Q to R in Figure 1D	Distance accomplished (from P to R in Figure 1D
5mm	9.33 ± 0.83	24.15 ± 9.45	15.13 ± 5.97
18 mm (range: 12-24)	9.43 ± 1.01	91.83 ± 23.54	46.78 ± 25.41
Difference	—	57.68 ± 4.01 ($p<0.01$)	31.65 ± 4.13 ($p<0.01$)

Mean measurements with their standard deviations are given. Sample included 40 seeds in each treatment.

movement and the distance accomplished by the seed, was investigated.

Large mature seeds (more accurately called caryopses in grasses, including the wild oats) of the wild oat (AN 51, a genetic line maintained at the Agriculture Canada Research Station, Regina) were used in the experiments. As shown in fig. 1B, each seed contained well-developed bent awns. For purposes of convenience, a rough wooden board was selected and each seed was placed on it in such a way that the awn with its awl was touching the surface of the board. This point was considered the starting point (Fig. 1A). Then a drop (or two) of water was placed on the awn and the seed. Ordinarily, the twisted (proximal) part of the awn begins to untwist making the awl also turn. The awn can also make six untwist-turns, making the awl also turn six times.[4] At the end of every turn, the awl, acting as a lever, hits the surface of the board. As it produces considerable amount of torque, the seed turns or rolls in the opposite direction.[5] As a result of this untwisting of the awn, eventually the entire awn becomes straight, changing from the bent condition (Fig. 1A,D). The straight condition of the awn is a good indication that the awn has imbibed water. As a result of this change of form from the bent to straight form, the seed will have travelled from position P to Q in fig. 1D. If the seed, with its straight awn, is left alone for some time the awn loses water and twists, eventually assuming the geniculate form (Fig. 1B,C,D). During this change the seed again will have travelled from Q to R (Fig. 1D). Thus in one cycle of this untwisting-twisting, the seed has travelled from position P to Q and then to R (Fig. 1D). This would represent the total distance travelled by the seed. The distance between P and R in fig. 1D was measured, and this distance from the starting point was considered the actual distance accomplished by the seed.

To determine the role of the awl in seed movement, another experiment was set up. The bent awns of mature seeds were treated in such a way that the awl length in each seed was cut to 5 mm. In the control seeds, the awl had an average length of 18 mm. The seed was allowed to have one cycle of untwisting and twisting. Table 1 shows the total mean distance travelled in one cycle of untwisting and twisting, P to Q and to R, and the distance accomplished, P to R, by the seed (Fig. 1D). The pattern of rolling movement of seeds on the wooden board was very similar both in the treated and the controls (Fig. 1D). However, the distance travelled, P to Q and to R, and the distance accomplished (distance between P and R) by the seed were significantly different (Fig. 1D; Table 1). In other words, the distance travelled and the distance accomplished were less for the treated seeds (5 mm long awl) than for those of the controls where the average awl length was 18 mm. Similarly, the distance accomplished by seeds with a shorter awl (5 mm) was significantly less than that of the seeds with longer awls (Table 1). This difference seems to be important with respect to habitat exploration by the seeds since seeds with longer awls can explore a greater area. Similarly, the accomplished distance is always much smaller than the travelled distance of seeds with either normal or shortened awls. It seems, therefore, that seeds tend to remain very close to the parent plant which, to begin with, has successfully explored and established in the same habitat. This could be one of the reasons that the grasses, including the annual wild oat, with functional awns (capable of movement) have survived in extreme ecological conditions, such as prairies where grasses are a dominant component of the vegetation. The success, following the above scenario, may be accentuated if the following seeds slip into nearby cracks or crevices, if any, in the soil where more favourable conditions may exist for seed germination and survival.

The movement of the wild oat seeds described above may be quite interesting for elementary and high school students to pursue as school science projects. Seeds are common in the agricultural areas of Saskatchewan. Students can collect wild oat seeds and conduct experiments on the movement of the seeds. The role of the length of the awl in seed movement and also the patterns of movement are excellent topics for study.

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In a radically different setting, the deep unlighted zone of caves around the world, blind white springtails, mites, and beetles feed on fungi and bacteria growing on rotting vegetable matter washed down through ground water. They are eaten in turn by blind white beetles and spiders also specialized for life in perpetual darkness. *E.O. Wilson, 1992. The diversity of life. W.W. Norton and Company, New York. 424 pp.*

THE NATIVE ELM BARK BEETLE: PRIMARY VECTOR OF DUTCH ELM DISEASE IN SASKATCHEWAN.

ELENA SCHACHERL, Administrator Dutch Elm Disease Management Program, Saskatchewan Environment and Resource Management, 112 Research Drive, Saskatoon, SK. S7K 2H6

Dutch Elm Disease (DED) has been present in North America since 1930, and has already destroyed millions of elm trees. First identified in Quebec in 1944, DED has been moving across Canada from east to west as well as northwards from the United States. The disease reached Manitoba in the 1970s.

In 1981 an isolated case of DED was found in Regina. DED was not detected again in the province until 1990 when it appeared in the Souris River valley near Estevan. Today this deadly disease is well-established in eastern Saskatchewan, with infection widespread in the Qu'Appelle, Souris, Pipestone, and Carrot River valleys.

Dutch Elm Disease is caused by a fatal fungus *(Ceratocystis ulmi)*. The fungus triggers a chemical reaction that shuts down the water-conducting vessels of the elm tree. DED symptoms first show up in late June, sometimes later, particularly after a cold or wet spring. The leaves of an infected tree will droop or "flag," curl, and turn yellow or brown. Another sign of DED is the presence of brown staining or streaking under the bark of a suspect branch. Once

DED symptoms *Elena Schacherl*

Adult Native Elm Bark Beetle *Manitoba DNR*

infected the tree will often die in as little as three weeks, and usually within a year.

American elm trees are most at risk, although some Siberian or Manchurian elms have also been known to become infected. They are also suspected of spreading the disease by serving as brood material for the beetle.

The primary vector of the disease in eastern Canada has been the European Elm Bark Beetle *(Scolytus multistriatus)*. This species of beetle generally does not survive the colder prairie winters. Instead, in Saskatchewan the disease is usually carried by the hardier native Elm Bark Beetle *(Hylurgopinus rufipes)*. This tiny beetle is only 2 to 3.5 mm., about the size of the head of a pin.

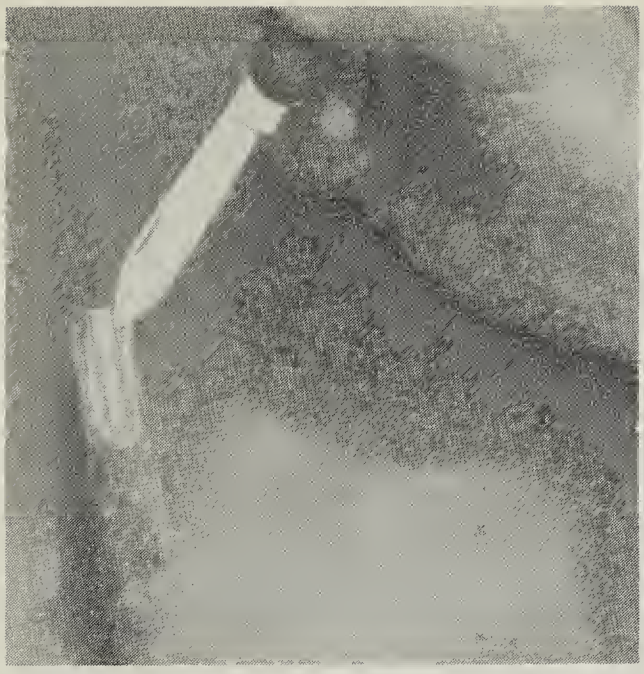
The sticky spores of the DED fungus attach themselves to the beetle during its feeding, breeding, and overwintering activities. The beetle moves around spreading the disease by crawling, flying, or hitching a ride on elm wood, often destined for use as firewood. Strong prairie winds also contribute to the beetle's movement.

An overview of the life cycle of the native Elm Bark Beetle further illustrates how DED spreads from tree to tree. The new adult beetle first emerges in late July or early August at which time it feeds on elm branches. Anytime from late August to the end of September (depending on the weather) the beetle bores its way into the base of an elm tree, preferably a healthy one, where it overwinters. It does not emerge again until spring (April-May) at which time it feeds again for a few weeks, and then breeds.

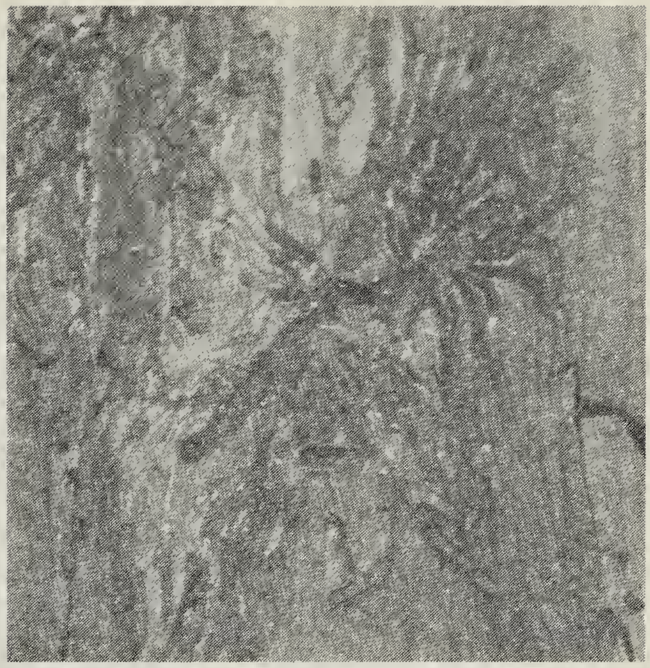
Some of the later emerging adults may also breed before overwintering, but research on the native Elm Bark Beetle carried out by Manitoba Natural Resources has shown that generally these overwintering larvae do not survive to adulthood. Some larvae may survive, however, in areas where the disease is poorly managed, as in wild elm stands.

The greatest incidence of DED infection occurs during the May and June summer feeding at which time the tree's vessels are most susceptible, although some infections may also occur in fall when the beetle overwinters.[1] The native Elm Bark Beetle makes an ideal vector because it bores into the bark of the tree during both feeding and overwintering activities.

The beetle prefers to form its galleries and lay its eggs in dying elm wood or the branches or trunks of diseased trees. The galleries of the native Elm Bark Beetle are usually



Wood staining - internal symptoms of DED *Manitoba DNR*

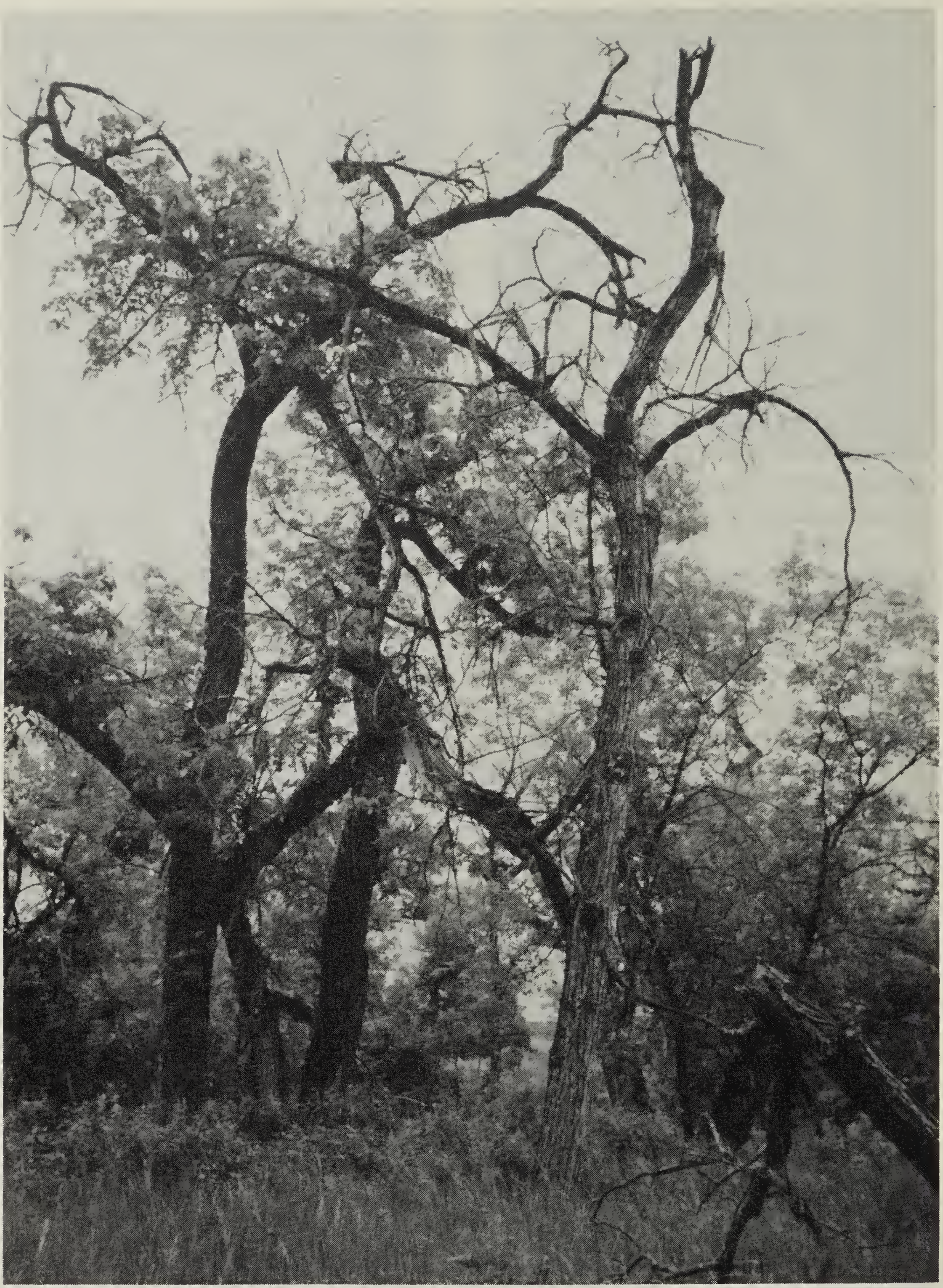


Brood galleries of the Native Elm Bark Beetle *Manitoba DNR*

horizontal, and the larval tunnels run with the wood grain. In contrast, the European Elm Bark Beetle bores its galleries vertically, and its tunnels run across the wood grain. The cut wood or tree needs to have at least 18% moisture content and its bark intact to be suitable brood material.

The life cycle of the native Elm Bark Beetle will vary with the particular season and the region. We know quite a bit about its behaviour in Manitoba and Minnesota, where the disease has been present for a couple of decades. We know less about its cycle in Saskatchewan, since the presence of DED is much more recent.

Whitewood research site *Elena Schacherl*



Whitewood research site - elms killed by DED *Elena Schacherl*

This year, for the first time, the Prairie Farm Rehabilitation Administration (PFRA) Shelterbelt Centre with the assistance of Saskatchewan Environment and Resource Management (SERM) and SOS Elms has undertaken a research project on the life history of the native Elm Bark Beetle in Saskatchewan. The project was initiated to find out more about the beetle's behaviour pattern in this province, particularly such activities as emergence, breeding, and overwintering. Two test sites were set up near Trossachs and Whitewood. Part of the research has involved testing various pheromone lures and trapping methods, to determine which are most effective in attracting the beetle.

The life cycle research will provide information needed to carry out effective DED management. Overwintering and emergence dates, for example, help determine when to spray. Chemical control can be used to reduce the beetle population, particularly when done on a community-wide basis. The chemical chlorpyrifos (Dursban Turf) is applied by a licensed applicator to the bottom few feet of elm trees, including above ground root flares. The best time to spray is late August or early September before overwintering takes place, but spraying can also be done early in April before the beetle emerges.

To prevent the spread of DED, provincial legislation in the form of *The Dutch Elm Disease Regulations* make it illegal to store or transport elm wood of any kind. Whether branches, firewood, or a DED-infected tree, **all** elm wood must be disposed of promptly by burning or burial in a designated disposal site. This limits the spread of disease outside of infected areas, as well as restricting brood material.

Fresh pruning cuts lure the beetle to a tree, and for this reason there is an annual elm tree pruning ban in effect from 13 April to 31 July. Once the ban is over, municipalities and landowners are required under the DED regulations to prune all dead and dying wood from their elm trees.

It will take years of research before we have a better understanding of the life pattern of the native Elm Bark Beetle in Saskatchewan. Knowledge about this DED vector is an essential component in the fight to save Saskatchewan's majestic American Elms from the ravages of Dutch Elm Disease.

To find out more about Dutch Elm Disease and what you can do to help save our elm trees, call 1-800-SASKELM (1-800-727-5356).

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To summarize the present global pattern, latitudinal diversity gradients rising toward the tropics are an indisputable general feature of life. And on the land biodiversity is heavily concentrated in the tropical rain forests. So immense are the insect faunas alone in these forests, comprising possibly tens of millions of species, overwhelming even the opulence of the coral reefs, that on this basis alone it is reasonable to suppose that over half of all species are found there. *E.O. Wilson, 1992. The diversity of life. W.W. Norton and Company, New York. 424 pp.*

REVIEW OF A BUTTERFLY FIELD GUIDE — 80 YEARS LATE

BERNIE GOLLOP, 2202 York Ave., Saskatoon, SK. S7J 1J1

The fascinating excerpts well on in this article are from what was probably the first field guide for North American butterflies: *How to Know the Butterflies — A Manual of the Butterflies of the Eastern United States*. It was written by John Henry and Anna Botsford Comstock, both professors at Cornell University, Ithaca, NY. The title page indicates that it was published by Appleton, New York, in 1917, but the copyright date on the next page suggests that the identical version may have appeared in 1904. (See also Cabbage Butterfly dates below.) I bought it for $17.75 at A Book Hunter — Wayne Shaw's secondhand bookstore in Saskatoon. It was originally purchased from Hazen-Twiss which did business in Saskatoon from 1912 to 1977. The signature at the front is something like D. (or S.) H. Birmia or Binnig.

It is a 311-page hardcover — about the thickness of the Audubon butterfly guide and, otherwise, with the dimensions of the National Geographic bird guide. A 34-page introduction deals with "structure," "clothing," "metamorphoses," and "study of the life of butterflies." The latter discusses and illustrates breeding cages, collecting equipment and methods of preserving. Text for each species includes a paragraph on "adults," on "caterpillar" and on "food-plants," followed by general comments. Keys are presented for all species by groups. Forty-nine black-and-white sketches and excerpts from some 40 poems are scattered throughout.

This volume illustrates 123 species of adults in 38 plates, compared with 453 in 35 plates of Peterson's 1992 eastern butterfly guide. With some 150 species in each province, Manitoba's butterfliers would have found 84 of their butterflies in this book, Saskatchewan's 69 and Alberta's 57.

All species are illustrated in colour — "plates from life reproducing the insects in natural colours." The legends for each plate are printed on a facing sheet of tissue paper. The images appear to be good colour photos but on the sheets facing illustrations of larval and chrysalid stages is the statement "From photographs by Professor M.V. Slingerland, coloured by Mrs. Slingerland." While not stated anywhere, something similar must also apply to the adult plates.

For adult butterflies, about two-thirds of the plates show from one to three species; the remainder have up to nine (skippers have 19 images); either the whole butterfly or half of it is shown. Sometimes male and female are depicted, sometimes upper and lower surfaces. Seven plates illustrate "transformations" of seven species, always with larva and pupa, sometimes including egg and adult.

Nomenclature over 80 (or 93) years has evolved into a problem. The most frequent changes appear to be in the scientific genus name, the fewest in the scientific species name. Some of the more interesting common name changes include from Blue-eyed Grayling to Common Wood Nymph, Purple Disk to Bog Copper, Canadian Skipper to Common Branded Skipper and Mormon to Hobomok Skipper. The most difficult to interpret was "Tessellate Skipper" wherein "Hesperia tesselatus" has no relationship to Common Checkered Skipper which it looks like from the illustration.

The general comments make for much more entertaining reading than the above. Here are some excerpts. (Names are given as they were then, followed by current common names, if different, in parentheses, from the North American Butterfly Association's 1995 checklist.)

Tiger Swallow-tail (Eastern and Canadian Tiger Swallowtails). And as if to demonstrate that it is truly at home wherever it may be and that it has no race or colour prejudice, it has in the South wives that are black. It is a brave flyer and lifts itself easily over houses and trees. It is especially a habitant of the latter; from our upper windows we have watched it fluttering about among the tip-top branches quite as much at home as on the lilac bushes or on the peonies of the lawn. It has a catholic taste in the matter of odour, and is equally devoted to fragrant flowers and to waste matter by no means fragrant. Its special weakness is tobacco smoke. When fishing in the Adirondacks it was one of the daily diversions of the senior author, while resting to smoke a cigar, to watch the tiger swallow-tails come one by one out of the wilderness and flutter about him with every sign of enjoyment; if he held quite still, they would settle comfortably on his forehead or shoulders a little to the leeward so as to enjoy to the utmost the luxury of a second-hand smoke. (p. 53)

Cabbage Butterfly (Cabbage White). If butterflies were in the habit of forming protective associations, some thirty years ago we would have heard of cabbage leaf petitions signed by various native Americans who were being supplanted by foreigners "plentiful and cheap." America had white cabbage butterflies of her own with most interesting and intricate histories; they were conservative in habits and did not appear in vulgar hordes, but took their toll quietly from all our cruciferous plants of the garden and especially from the cabbage. In 1860 the European cabbage butterfly was introduced at Quebec, and in 1868 it gained footing in New York. From these points has spread this important foreigner and, by appearing earlier in the season and having more broods a year, it has starved and driven out of American gardens the native cabbage butterflies; these have fled before the invader to the wilderness and there lead a precarious existence on wild Cruciferae. (p. 79)

Those old days when the balancing of a yellow butterfly over a thistle bloom was spiritual food and lodging for a whole afternoon. Lowell (p. 87)

Roadside Butterfly or Clouded Sulphur. It hovers over flowers of the field, especially loving the yellow blooms; but more than all this, it loves to hold banquets around the mud-puddles in the road. Almost any time in August when driving along a country highway we may see at a distance in front of us a shining yellow blotch which scatters on our approach into a hundred yellow butterfly fragments; and if we afterward examine the spot closely we can see the mud perforated with "pinholes" where these thirsty creatures have thrust their long tongues. (p. 93)

Great Spangled Fritillary. When we were children a familiar sight to us on our journeys to and from school were certain large round-winged tawny butterflies settling themselves as best they could on the thistle blossoms. When finally engaged in exhausting the sweets at this roadside restaurant, their wings were lifted and closed and we saw on their lower sides what we called "butterfly money." This currency was of various denominations, and near the edges were what we called "dollars" broken in halves and set in a row, a fact which puzzled us until we discovered the lost halves set in a row on the opposite wing; a charming lesson in short division this. (p. 115)

Silver-spot Fritillary (Aphrodite Fritillary). When we made our childish observations on the butterflies that had adopted a free silver coinage we often crept up carefully and seized one of them by his closed wings and counted his "dollars" for him. (p. 117)

Mountain Silver-spot (Atlantis Fritillary). If our childish fancy about butterfly money were true this fritillary would carry on its wings the currency of the Dominion of Canada, for there is its home and it only visits our mountains and highlands. (pp. 118-119)

Meadow Fritillary. This little fritillary has put no money in its purse; there is not a single silver spot, angular or round, to be found on the lower side of its wings ... It has some queer habits. Many of the butterflies of the first brood appearing early in May evidently feel that they have the whole summer before them and are likely to neglect the important transaction of egg-laying for several weeks. (pp. 120-121)

Silver-bordered Fritillary. When in our childish ignorance we regarded a small butterfly as not yet fully grown, we often found on thistle blossoms in the pasture certain small butterflies that carry "money" under their wings and we thought them too young to be trusted with so much silver. (p. 122)

Pearly Eye (Southern and Northern Pearlyeyes). The pearly eye, clad in fawn-coloured satin ornamented with oblong medallions of seal-brown velvet, is, from the point of view of the modiste, the most beautiful of our American satyrs ... in the north as far as Manitoba and Nova Scotia. (p. 190)

Eyed Brown. For many years, and also in many books, the species is called eurydice; but Orpheus has evidently found another Eurydice among the butterflies, a daughter of the sunlight instead of the shades, and this one disports itself under the name of canthus. (pp. 192-193)

Little Wood-Satyr. This lively butterfly is as jolly as a little wood-satyr ought to be. It has a skipping, dancing, care-free flight, never rising far above the ground. (p. 198)

Monarch. The male monarch is the dandy among butterflies par excellence. He is not only trig in figure and gorgeous in colour, but on each hind wing he carries a black sachet bag for the allurement of his lady-love. And she is as brilliant as he, but lacks the perfume pockets. "I am monarch of all I survey" is exemplified in the confident, serene flight of this butterfly ... Nor is the monarch satisfied with these journeys to the north and south; it is the strongest flyer of all the butterflies and does not hesitate to try its fortune over the seas, and has been found flying five hundred miles from shore. Either by flight or as stowaways in vessels it has pressed eastward to Europe and westward to the isles of the Pacific. (pp. 205-06)

Acadian Hair-streak. This butterfly must have been expelled from Acadia with Evangeline, as there is no record of its having been found as far north as Acadia since it was discovered and named. (p. 225)

Banded Hair-streak. From the West comes the report that in the spring it shows a liking for the odoriferous skunk-cabbage, a plant which seems to have more friends among insects than among folks. (p. 227)

Hoary Elfin. It is the laziest of all the hair-streaks and loves to loaf around shrubs in open places, and even haunts the roadsides. The caterpillar is a little rascal that burrows in and devours the fruit of the wild plum. (p. 233)

American Copper. We have always been very sorry for those unfortunate people who have never had a pair of these beautiful midgets as tenants of their lawn. For years we have had at least one pair on ours to fly at us when we came out and by making desperate dashes at our heads try to drive us off of what they consider their preserves. They evidently base their claims on the presence of sorrel, which once we would have deemed a disgrace to any lawn. But lawns, like children, were evidently meant to educate their possessors; and while we began with strenuous effort to have only clover and grass on ours, indefatigable Nature planted all things there as soon as our backs were turned. After a time we grew in grace and came to love the dandelions and dock, orchard grass, and white daisies; and more than all do we appreciate the rosy bloom which sorrel lends to our possessions, especially because of it, a pair of American coppers live with us ... Once we saw them attack a tiger swallow-tail and drive him off the premises; and once we saw them chase a huge bulldog with the same confidence and aplomb. (pp. 242-243)

Silvery Blue. There are several things in this world that it were better to know nothing about, such as a perfect passage of music or a bit of exquisite colour. Both were meant to appeal to the soul through the senses, and knowledge about them is superfluous and a distracting factor, Therefore we feel a certain satisfaction in not being able to give any facts about life history of the silvery blue. All that we know is that it bears on its wings a blue found nowhere else in the world except in the pearly spectrum of the sea-shell ... (p. 246)

Tailed Blue (Eastern Tailed-Blue). The tailed blue is in possession of the greater part of America from the Atlantic to the Pacific, from the Isthmus to the British dominions. (p. 255)

Bubble, bubble flows the stream
Like a song heard in a dream.
A white-faced hornet hurtles by,
Lags a turquoise butterfly —
One intent on prey and treasure,
One afloat on tides of pleasure!
Maurice Thompson (p. 255)

They don't write field guides like that anymore!

Astronomy

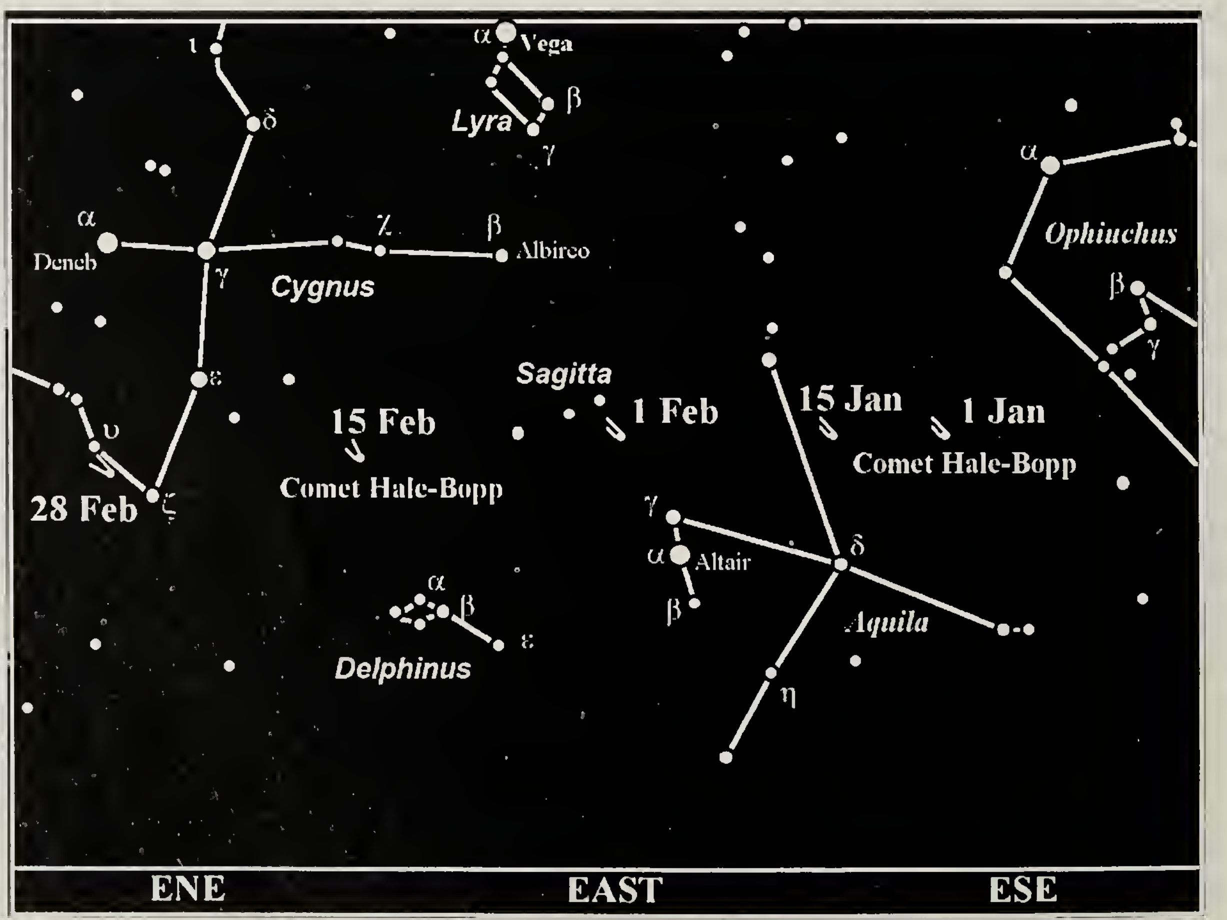
COMET HALE-BOPP — 1997's BIG EVENT?

STANLEY SHADICK, Department of Physics, University of Saskatchewan,
Saskatoon, SK. S7N 0W0

The following article is adapted from a selection in the 1997 Canadian Skywatcher's Trivia Calendar, written by Stan Shadick and published by Fifth House Publishers (1-800-360-8826).

Way out beyond Pluto's orbit, a vast swarm of icy comets slowly orbit our Sun. These dirty snowballs represent debris left over from the disk of gas and dust that formed the planets, 4.5 billion years ago. Occasionally, tides, generated in this swarm by the collective gravity of numerous distant stars, divert a few of these frosty missiles into the inner region of our solar system. The gravitational tug of an occasional passing star may also divert a few.

As they approach on long, elliptical orbits, the warmth of the sun vaporizes cometary gases that have laid dormant in a frozen state for billions of years. The released gases and dust particles form long, arched tails that may extend as far as the Sun's distance from Earth. The early Greeks described such phenomena as "kometes," meaning long-haired,



Position of Comet Hale-Bopp during January and February.

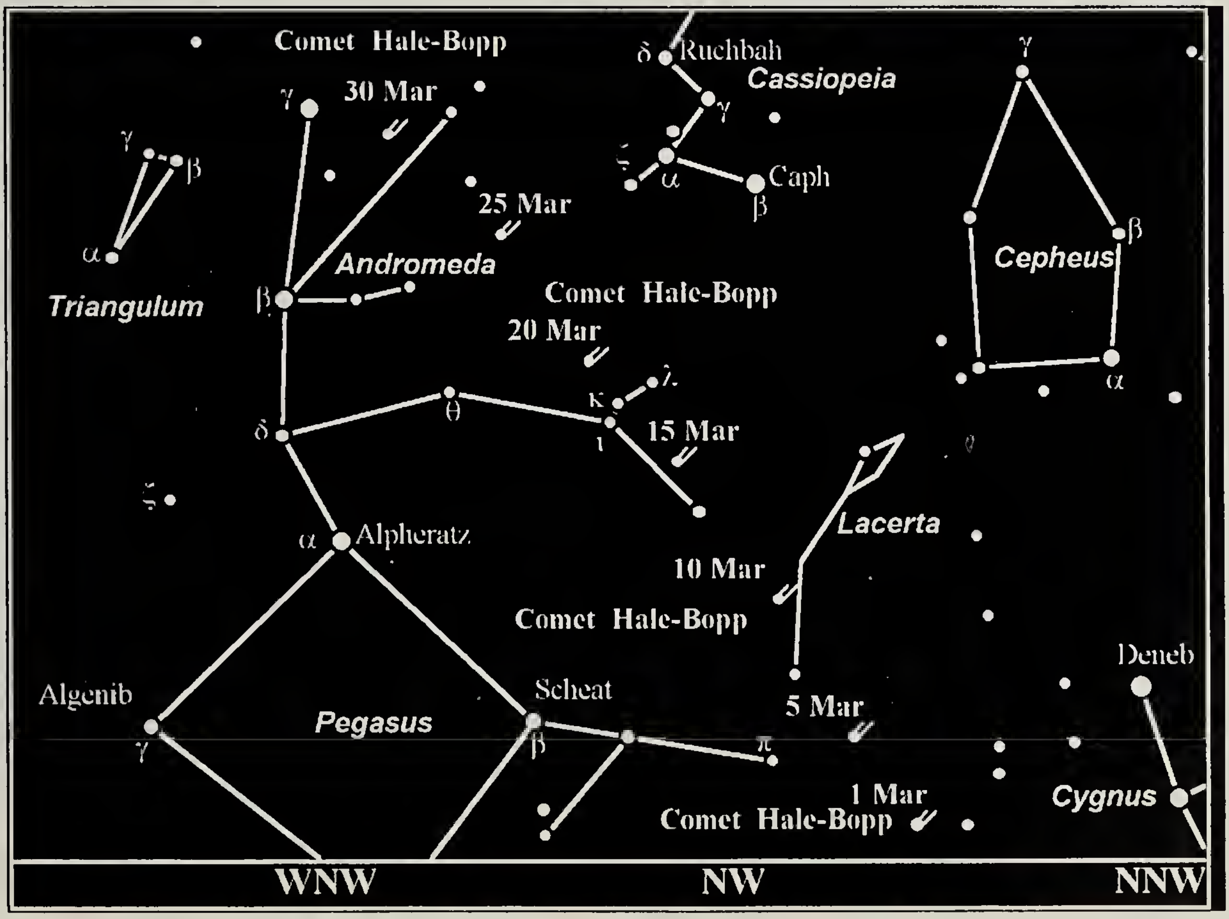
from which our word comet is derived.

Prior to its 1910 return, astronomers predicted Earth would pass through the low density tail of Halley's comet. Newspaper writers created a sensation after reporting that poisonous cyanogen gas could be present in the comet's tail. Even though the density would be too low to have any adverse effects, some people panicked. Charlatans made a killing selling comet pills (made of sugar) to protect the frightened public from such cometary gases.

Ancient superstitions held comets to be evil omens. The death of the Roman Emperor Macrinus was blamed on the sighting of Halley's comet in 218 AD. While dismissing such alarmist propaganda, some scientists suspect that a collision of a comet with our planet may have killed off the dinosaurs, 65 million years ago. In July 1994, the world watched Comet Shoemaker-Levy 9 crash into Jupiter. Perhaps the ancient fear of comets was not too far off the mark.

The close approach of a comet to Earth creates the greatest spectacle of the nocturnal skies. Only a few such displays occur in a lifetime of observation. The 1910 appearance of Halley's comet was preceded by an even more spectacular comet, a few months earlier. Halley's return in 1986 was a disappointment by comparison, as it passed on the far side of the Sun. The last dazzling comets to grace our skies were Comet West in 1976 and last spring's magnificent Comet Hyakutake, which passed within 15 million km of Earth.

On the night of 23 July 1995, two amateur astronomers, Alan Hale and Thomas Bopp discovered a comet to rival Hyakutake. If it lives up to expectations, Comet Hale-Bopp may dominate the dark evening skies of March and April as it passes within 200 million km of Earth. The following charts will help you follow its approach.



Position of Comet Hale-Bopp during March.

The first chart shows the position of Comet Hale-Bopp during January and February as it traverses the eastern sky, 90 minutes before sunrise. As the year begins, the comet is still 380 million km from Earth. The view will improve through February as the comet's distance decreases.

The second chart follows the comet's path through March as it moves into the northwestern evening sky, 90 minutes after sunset. Hale-Bopp makes its closest approach to Earth on 22 March, when its distance is only 197 million km. The comet should be at its best during the last week of March, since moonshine will no longer interfere with observations.

After passing the Sun on 31 March, Comet Hale-Bopp will remain visible throughout April. Its position in April is illustrated in a full colour map, found in the Canadian Skywatcher's Trivia Calendar.

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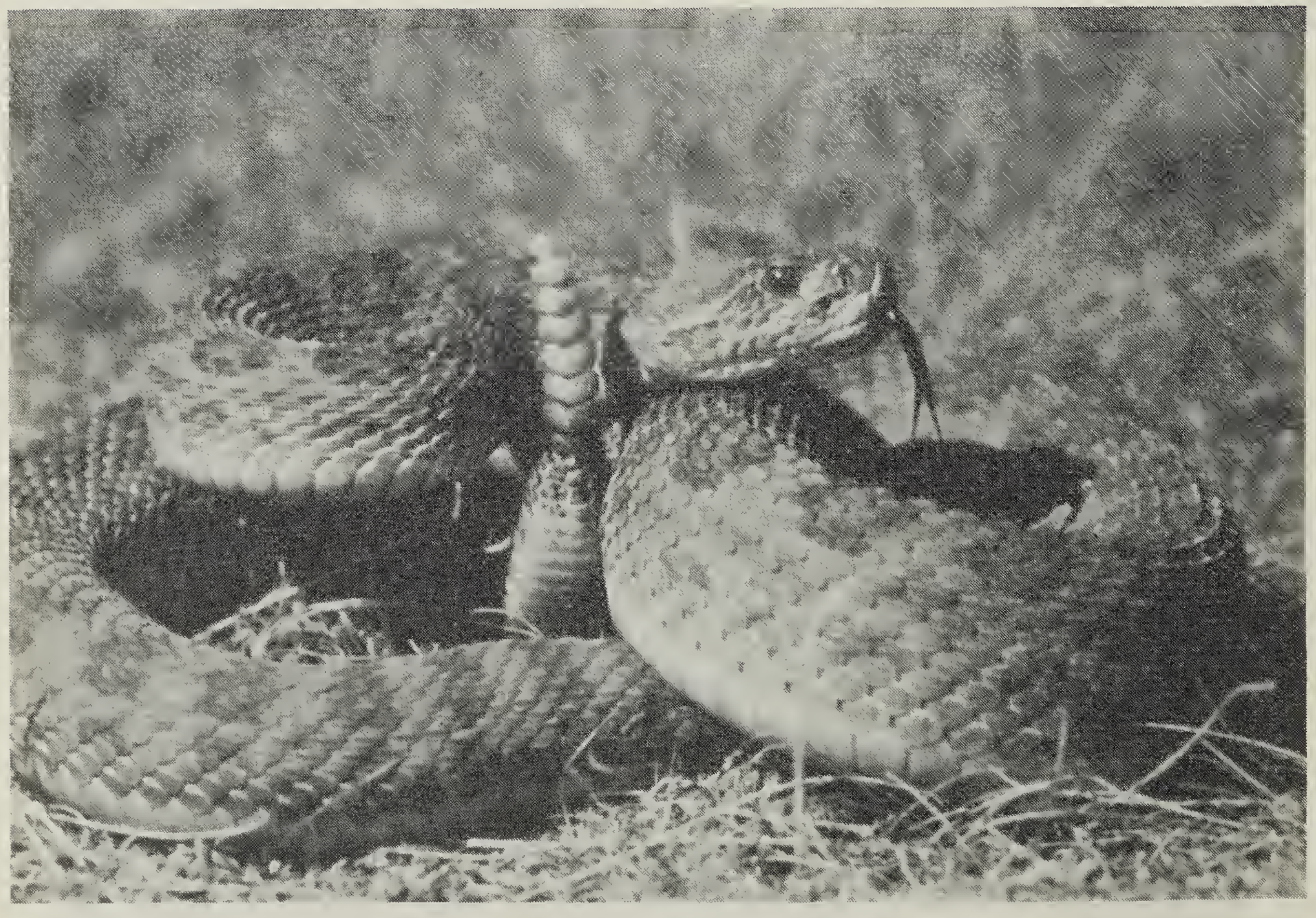

Prairie Rattlesnake *Wayne Lynch*

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BIRDS OF THE ELBOW

J. Frank Roy. 1996. Special Publication No. 21. Saskatchewan Natural History Society, Regina. 325 pp. $30.00 *(Available from the Blue Jay Bookshop)*

This is the third in a series of publications supported in large part by funds provided by the late Manley Callin. As the author states: "The ultimate purpose of this book and others in the Callin series is to help Saskatchewan people appreciate the natural heritage which is theirs — a heritage to enjoy now and to preserve for generations to follow." Manley Callin would, I think, be pleased with this informative and well-illustrated work which so aptly meets that objective.

Measuring about 8x11 inches, with 30 colour photographs and 26 drawings, this is a sumptuous production. In a delightful foreword Margaret Belcher notes: "The extensive area he covers in the southwest of the province is country into which Frank Roy longs to take the reader, for whom he plots myriad expeditions to his 'birding spots'." The photos, by George Tosh and the author, shatter the myth of the "endless flat prairie." I've seen some of the area, having been fortunate enough to attend a SNHS field meet at Beechy, but even so I was overwhelmed by the beauty and grandeur of the views of that abrupt bend in the South Saskatchewan River known as the Elbow. This is a serious and exhaustive compilation of all known bird records for an area which is, according to the author, "three times the size of Prince Edward Island," with an appropriate analysis of the significance of the information.

Birds of the Elbow covers 301 species, of which 131 are known to have nested, plus another 11 which are believed to breed. The challenge for young naturalists living in or near the Elbow is to help fill in the gaps which Roy identifies — find that first Bobolink nest! As one might expect from a teacher of English, the species accounts are informative and lively, with a good combination of factual and anecdotal material. Easy to read, the accounts tell how and where to find and identify the subjects, give spring and fall migration dates and numbers, nesting data, life history notes, winter records, and banding information, the latter surprising us with numbers and results of banding recoveries. It is clear that the author has had much experience in both the field and the library. His presence though constant, is not intrusive. We can share his enjoyment of birds in such direct statements as this opening line for the Fox Sparrow account: "I look forward to transient Fox Sparrows." Though a serious birder and scholar, Roy's wry sense of humour emerges now and then; in describing the amenities at one good birding spot he notes: "The pit toilets in this area are open all year, although in winter you may have to shovel snow to get the door open!"

For a reference book of this size and weight, the cover material seems a little thin. My copy has already frayed on the back corners. I could wish, too, that the excellent photographs had been left with a little margin rather than being tightly bound into the centre, as is true for several. The drawings vary greatly in quality, the 26 by Trevor Herriot ranging, in my opinion, from fine (Eared Grebe, Wilson's Phalarope) to poor (American Goldfinch, Ferruginous Hawk). Herriot's Ferruginous Hawk hovering over a nest is just anatomically impossible. Most of the drawings could have been much reduced. This would have provided space to remedy the annoying separation of species account lead from the body of the text — this happens 14 times. Although only a minor distraction when the text follows on the page opposite, in 10 instances the species name sits alone at the bottom of a page, with the text appearing overleaf. This curious fault should have been caught by the layout people. Despite the usual intensive search for typos, I found only three, none of significance (one, p. 271, two, p. 306); someone worked hard! The author was able to incorporate the latest name changes, not an easy task in these days of nomenclatural shifting. I noted one small slip in this connection — in the discussion of hybrid flickers (p. 44) the names used don't jibe with the names given in the species accounts. And I take it that the omission of the title "Pigeons" for the aptly descriptive poem on p. 181 is another small slip.

This book provides information on geology, topography, ecology, history, conservation, land use, etc. — it is much more than a bird book. The 19 maps will aid anyone seeking access to the Elbow country; Roy's numerous polite reminders to respect landowner's right should benefit all concerned. With its many fine features, *Birds of the Elbow* sets a fine example, whether as a regional report, a provincial or state bird book. It fills a large gap in the ornithology of the Northern Great Plains. It's a lot of book for the money. Well done, Frank!

- Reviewed by *Robert W. Nero,* 546 Coventry Road, Winnipeg, MB. R3R 1B6

MY LITTLE BOOK OF BURROWING OWLS

HOPE IRVIN MARSTON, illustrated by Maria Magdalena Brown. 1995. Published by NorthWood Press, Inc. *$8.00 (Available at Blue Jay Bookshop)*

Ms. Marston's book brings the reader through the arrival of a Burrowing Owl pair settling on the prairies for the summer. The story follows the owls as they prepare their summer nest, and raise a family on the prairie grassland. The reader is taken into the lives of the owls, and is given a description of some of the dangers the young owls face as they grow up.

Bright, eye-catching illustrations by Maria Magdalena Brown accompany Ms. Marston's simple story. Despite minor inaccuracies (i.e. the Burrowing Owls are depicted with feathered legs when, in actuality, their legs are bare), the book captures the engaging mannerisms of the endangered owls. The prairie grasses and flowers in the landscape are drawn with beautiful detail. The simple story, and colourful illustrations should appeal to any child more eager to look than listen!

- Reviewed by *Neeru Verma*

THE WHOOPING CRANE

JEROME J. PRATT. 1996. Rose Printing Co., Inc. Tallahassee, Florida, U.S.A. 171 pp. $17.95. *(Available from Castle Rock Publishing, 1712 Pine Woods Road, Prescott, Arizona, USA 86301)*

The back cover of this soft-cover book proclaims that aviculturists, biologists, zookeepers and government officials were responsible for the success in the recovery efforts for the Whooping Crane. The publication announcement issued by the Whooping Crane Conservation Association (WCCA) indicates the book relates work on biological investigations, captive breeding, behaviour and the policies needed to support the work. I find this to be only partly correct; the title of the book should have been "A history of Whooping Crane Conservation Efforts."

As history is often biased (depending on who writes it), so is this book written from an aviculturist's viewpoint. Mr. Pratt, a long time and highly respected executive member of aviculture since childhood, once owned and operated a commercial game farm in the USA. The executive of WCCA (the agency under whose auspices the book is published), has always been composed largely of people involved in aviculture so the emphasis is not surprising.

There are several instances in the book where avicultural credit for Whooping Crane conservation is exaggerated or misplaced. On p. 12 it is stated that the Canadian Wildlife Service (CWS) and its U.S. counterpart (USFWS) accepted avicultural advice in removing eggs from wild whooper nests. As the person directly involved in the first egg pick-up in 1967 I know this is not correct. The 16 May 1967 letter of instruction by CWS in part was based on completely erroneous data on laying dates and contained gems of wise advice such as taking care "not to allow seismic nest-marking tape to wind around the helicopter's tail rotor." There was no avicultural advice and no "game management expertise"; what we did have was common sense and maybe a little luck.

The historic aspect of the book is evident in its organization. Pages 21-45 are reprinted from Walkinshaw's 1973 *Cranes of the World* (Chapter 6) and this chapter already contains many quotations from yet an earlier publication, *The Whooping Crane* by R.P. Allen (1952). Furthermore, there is an eight-page contribution from C. Cottam (containing a 1958 population status report. Why?), a four-page addition by D. Hyde (1961), and five pages by E. Bizeau, a 1975 paper.

The 28-page bibliography (16% of the book) is an enigma. Of the 695 titles, some dating back to the 1700s, only 87 are referred to in the text. Conversely, over 30 papers or books mentioned in the text, are **not** listed in the bibliography. None of the titles in the bibliography are more recent than that of a single 1984 paper. Studies in Wood Buffalo National Park (WBNP), along the migration route and in Texas, conducted during the past 20 years, receive only scant mention in the text and are not listed in the bibliography. Why the work is apparently ignored is not clear to me, as I know Mr. Pratt received copies of published field studies. But perhaps these papers fall in the category of, as Mr. Pratt writes, "contributing little to the survival of the Whooping Crane." However on page 67 he contradicts himself when he writes "egg collecting from wild nests has led to ... management practices which are believed to be responsible for the survival of the species." He could have specifically referred to the technique of field-testing viability of crane eggs in WBNP, which, when analyzed from 1985-1988, increased hatching success of eggs left in nests by 11.7%-15.5%.

It should be remembered that many of the studies summarized information obtained from the surveys of cranes, their nests and eggs, their migration habits and winter range. As Mr. Pratt states, many of these papers are filed away and forgotten, but if the studies are worthy of mention (e.g. pages 17-18, 45, 84-87), they are worthy of proper reference.

There is considerable repetitious material in the book, such as descriptions of the discovery of the nesting area in WBNP (pages 23, 63), named captive birds (pages 101-103, 110-114, 127) and migration (pages 27,125).

I found the historical description of the genesis of Whooping Crane conservation to be the most interesting part of the book (even though it contains inaccuracies), and Mr. Pratt deserves credit for pulling this aspect together, a section of the crane's history he was part of for so many years. I also enjoyed the black and white photographs of colleagues from Canada and the U.S.A. and the four group photos of WCCA members, including the entire Kuyt family in 1972, 1976 and 1983.

Some omissions should be mentioned. Even though the book contains much discussion about famous birds, such as Crip, Josephine, Rosie, kept captive in the San Antonio and New Orleans Zoo for many years, no mention is made that most of the reproductive efforts of these and many other captive birds resulted in infertile or abnormal eggs. More recently, captive breeding and rearing of captive whoopers, notably at the Patuxent Environmental Research Centre has greatly improved, hopefully reaching the point when we no longer need to take eggs from the wild. Also, no mention is made that, although captive breeding of whoopers has been in progress since 1966 and well over 400 surplus eggs removed from WBNP and transported to the U.S.A., as of today ***not a single*** truly viable (i.e. self-perpetuating) Whooping Crane has been added to the wild migratory population as a result of 30 years of captive breeding!

I would like to make one suggestion. It is hoped that future writers differentiate between the various “kinds” of whoopers. When giving “box scores,” we should compare today's wild migratory flock (the WBNP-Texas population) with the original wild population of previous years. Do not lump Florida birds (introduced into the wild from captive stock), birds held “captive” by the invisible membrane of their changed behaviour (which renders them non-migratory) with our normal whoopers which pass through Saskatchewan in their age-old fashion.

Finally, the book contains numerous errors of fact but also some curious statements such as “captive breeding returned the Trumpeter Swan to a stable population,” “air transportation of sandhill cranes eggs ... has been ... found not feasible” and “there is no difference between a chick hatched from a wild ... egg, and one from a captive egg, at the time of hatching.”

In summary, this is not a book about the interesting biological details of a fascinating endangered bird but a treatise of the history of captive management of Whooping Cranes, supplemented by previously published biological information, much of it now out-of-date.

Fortunately the book at $17.95 Canadian is relatively cheap.

- Reviewed by *Ernie Kuyt*, 3810 - 103B St. NW, Edmonton, AB. T6J 2X9

NOTES

THE SWIFT FOX

On 26 July 1996 while coming home from Kyle, 8 miles south and 6 miles west, I noticed what looked like a cat, lying flat on the edge of a summer fallow field, just across the ditch.

On getting closer I noted the ears were a little large and the nose a little long for a cat. After driving a quarter mile past, I turned around and drove slowly by again, and realized that it was either a Swift Fox or a young Coyote.

Again I kept going until a half mile past, then turned and drove slowly until just by the animal when I stopped. Now the animal stood up, took a few steps then stopped and looked at me, and having seen Swift Foxes before, I am certain that this was one.

The colour was very much like a Coyote, with a black-tipped tail but features of a fox, and the size of a cat.

The animal had dug out both ends of a culvert that had been buried with blow dirt for years, and had been there for some time.

I saw Lloyd Sather, the owner of the land, and asked if he had seen the animal and if he knew that it was a Swift Fox. He replied that he had seen it a few times, but thought that it was a fox that was not doing well.

Sig Jordheim, Kyle, SK.

STRANGE BEHAVIOUR OF A FEMALE AMERICAN ROBIN

5:30 a.m., 3 May 1996. I have just awakened and am lying in bed wondering what woke me. I hear a noise something like a light tap and then a brushing sound. I think it is the furnace coming on and the pipes expanding. No. It's also not like the noise you hear at -40° when the house contracts with the cold. I lie in bed and listen. The sound is intermittent and varying in intensity. The next time I hear the noise, I get up and sit at the kitchen table where it seems to be coming from down the hall. I go to the first bedroom and then the second. Then I hear and see something hit the window. When I look out, I see a female American Robin sitting on a spruce branch about two feet away. She flies at the window, hits it and flies back to the branch. I find this unusual as I thought that only males would defend their territory. This Robin seems to be seeing its reflection in the window and to be trying to chase it away.

I now close the blinds and go back to bed. The Robin continues her attack. This time I get up and remove the screen. This does not work either. I get up again and pull the blinds up to the top. The attack continues. I get up and open the window so the angle of reflection is different. The Robin still attacks the window, so I get up, close the window and put on the light, but this does not work. When she is about to attack again, I turn the light off and on as fast as I can several times. She still attacks, even with the light blinking. Off and on all day long the attack continues.

Next morning at 5:20 a.m. the Robin starts again. I get up and shut the bedroom door so I can't hear the noise, then go back to sleep. But I am determined to outwit the Robin. So I get up to get my pruning saw and cut off the branch she sits on, and a few extra branches, so that she won't be able to look across and see her reflection in the window.

With no branches to sit on, the Robin now sits on the top of the downspout at an angle from which she cannot possibly see herself. Still she attacks the window! The only explanation I can give is that this Robin is an Alice trying to get through the looking glass.

Keith Barr, 40 Richardson Crescent,
Regina, SK. S4S 4J3

WHOOPING CRANES INVADE SASKATCHEWAN

During the 1996 fall migration Whooping Cranes were observed in unprecedented numbers in Saskatchewan. At least 98 (including 10 young) of the estimated 165 ± Whooping Cranes in the Wood Buffalo-Aransas flock of Whooping Cranes were reported to the Canadian Wildlife Service Whooping Crane Hot Line between late August and the end of October. The cranes were observed from Meadow Lake to Estevan, with the majority of birds being within 100 km of Saskatoon. The Canadian Wildlife Service monitors this population and during the summer of 1996, 44 pairs of cranes nested. In late May and in June at least 32 chicks hatched, however, as is the norm, chicks disappeared as the summer progressed and only 14 were observed in mid August. As the birds arrive on their wintering grounds at the Aransas National Wildlife Refuge in Texas they will be counted by the U.S. Fish and Wildlife Service. A total count of this population will be available by year end.

The new International Whooping Crane Recovery Team (an amalgamation of the Canadian and U.S. Recovery Teams) met for the first time this year. The team directs recovery activities for the cranes following guidelines laid out in the Whooping Crane Recovery Plan. A few of the activities that the team is involved in include: research into the habitat and food requirements of the cranes on their breeding and winter ranges; investigations into reintroduction techniques and suitable reintroduction areas; captive breeding for research and release; and introduction of birds into the wild.

For the past two years Canadian Wildlife Service staff, in cooperation with Parks Canada, have been investigating crane foods in the breeding area. Techniques used involve the identification and matching of carbon and nitrogen isotope levels in crane feathers and potential food items as well as analysis of crane droppings. Parks Canada staff have been using satellite imagery to map crane habitat and recently began classifying the habitat in the nesting area. U.S. personnel have and continue to investigate winter foods and habitat.

A new non-migratory flock (to replace the one that died out in Louisiana) is currently being established. Cranes, bred in captivity for release, are being introduced into the wild in Florida. To date about 50 birds survive with the oldest just arriving at breeding age. The Calgary Zoo, which produced their first Whooping Crane chicks this year will be sending three cranes to join others from U.S. breeding centres for release later this winter.

Innovative research is being conducted into reintroduction techniques for establishing another migratory flock of Whooping Cranes. Sandhill Cranes are being taught to migrate with an ultra-light aircraft to establish new migration routes. Early results are encouraging but more work needs to be done before the recovery team endorses the technique as a viable option for establishing new breeding and wintering areas for Whooping Cranes. Areas under consideration for such a migratory flock include Manitoba and the southeast United States.

In the mean time the Aransas-Wood Buffalo flock continues its slow but steady increase. The population which once numbered only 15 birds reached a high of 146 birds in 1989 but was only able to break the 150 mark this past year. The stability of the winter range in Texas continues to cause concern for the recovery team. The sooner we are able to encourage Whooping Cranes to winter in more than one locale, through establishing additional populations, the safer the survival of the Whooping Crane becomes.

Brian Johns, Canadian Wildlife Service, Saskatoon, SK.

GREAT BLUE HERON EATING A RICHARDSON'S GROUND SQUIRREL

While checking on his cattle on pasture, our neighbour, Ernie Quintal, noticed a Great Blue Heron in a stalking pose over a gopher (Richardson's Ground Squirrel), stunning it, and then grasping it in its beak. It then flew to a nearby cattle watering hole (actually a rather shallow pothole) where it upended the gopher to grasp it by its head. It then dunked the gopher in the muddy bottom of the pothole. This operation was repeated four or five times until the gopher was drowned and covered with gooey mud. The heron then raised and opened its beak and proceeded to swallow this adult gopher with apparent ease.

The above procedure was later witnessed by myself, accompanied by Ernie and several other people, at various times during a two-week period. As far as we could ascertain, it was always the same heron as it would drive other herons away if they entered on its turf. Ernie observed several gophers being consumed in a single morning. Later in the season, as water levels rose, the heron would take its kill to other more convenient water holes.

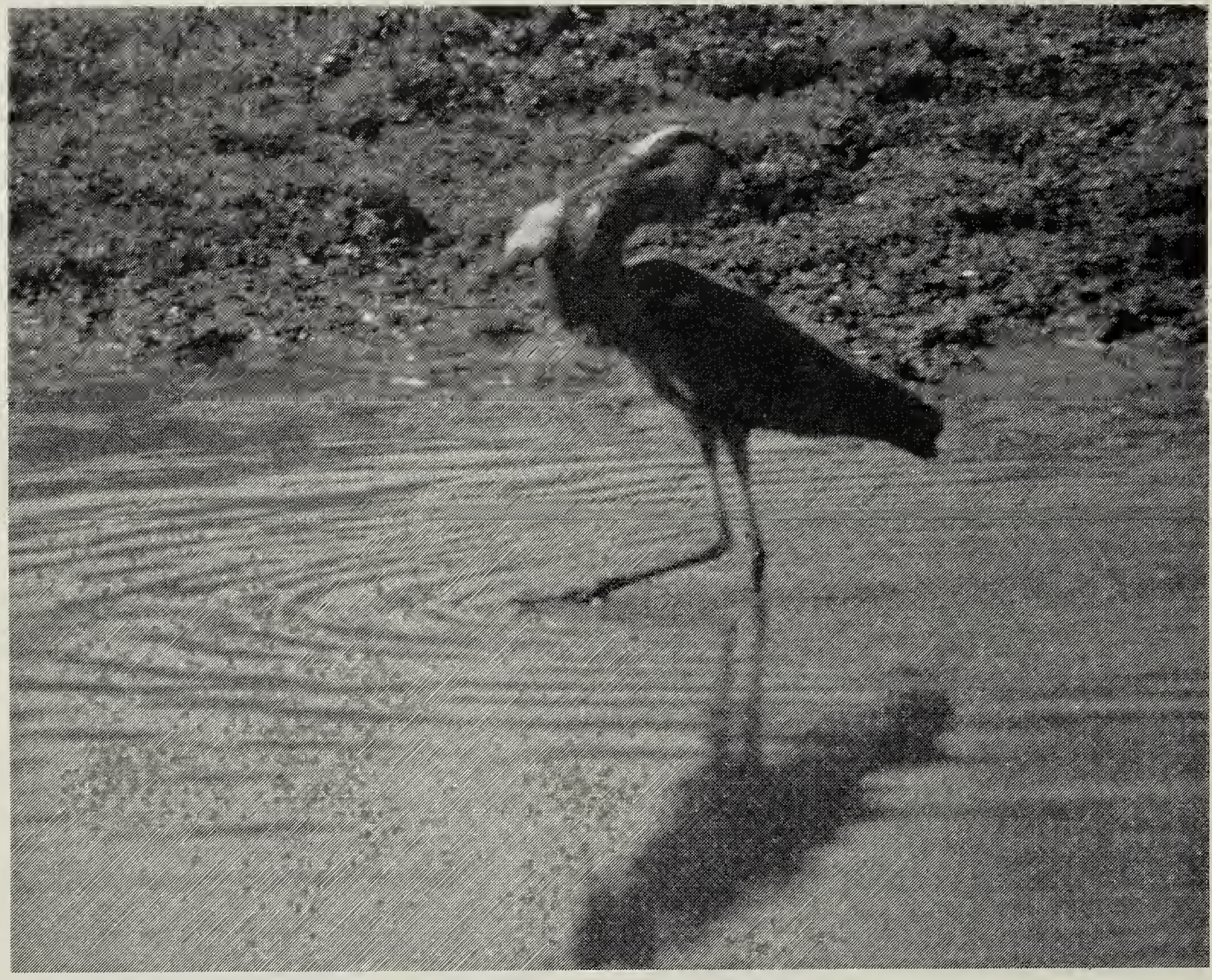
The pasture area was literally a "holey land" occupied by many of their immature offspring. Later in the summer, the young gophers were seen to be eaten directly without the drowning and mudding process; presumably because they were easier to swallow.

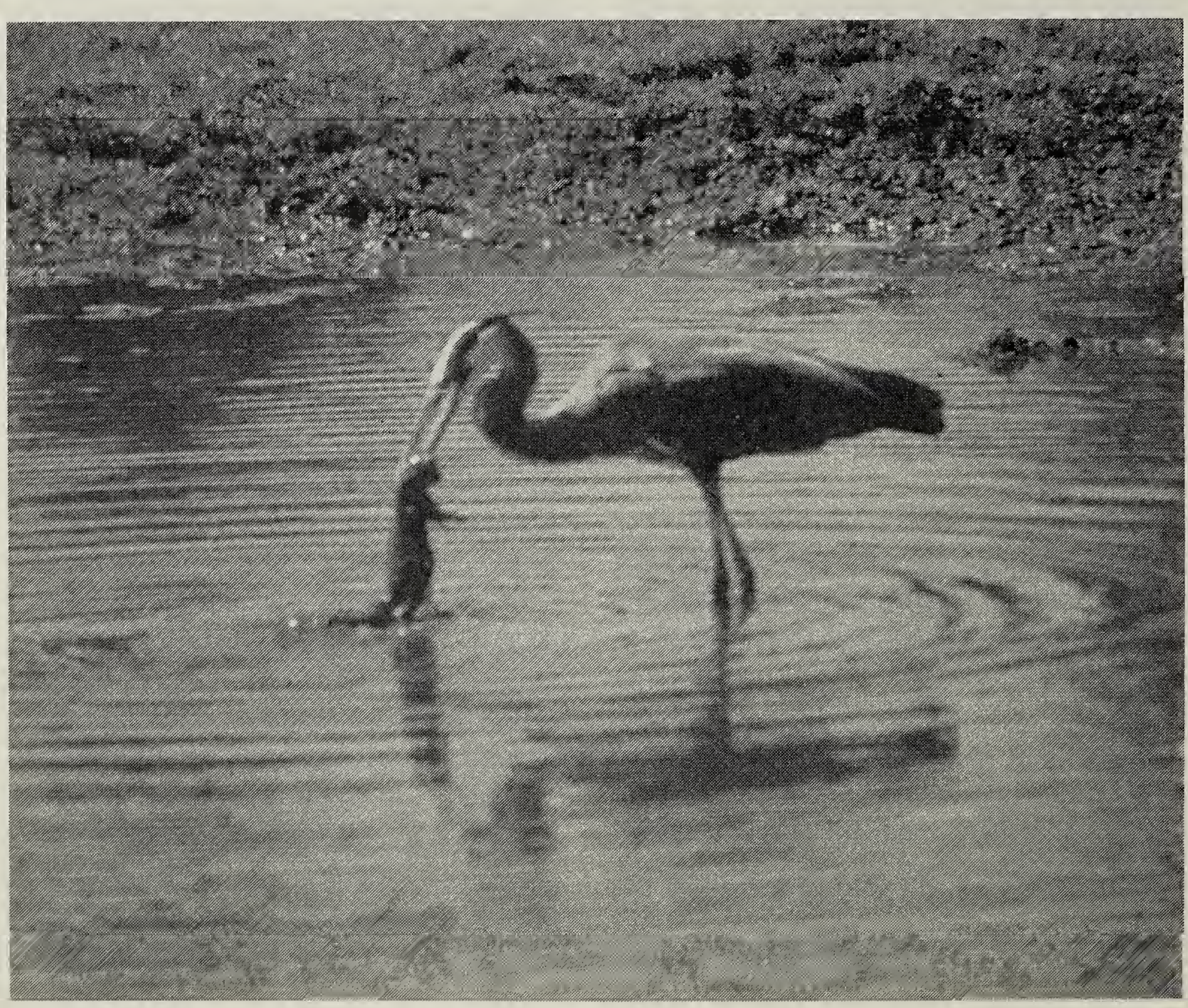
Water levels in this area have been very high this year, resulting in receding shorelines and possibly a shortage of suitable feeding sites for herons. Several other observations of gopher-eating herons have been reported.

The particular sighting captured on the enclosed slides took place at Ernie Quintal's farm, near Lac La Biche, Alberta: NE 1/4 Section 1-67-13-W.4 on 25 June 1996.

Jerry Sykes, Lac la Biche, AB.

Great Blue Heron drowning and swallowing a Ground Squirrel





RECENT OBSERVATIONS

The following are reports of unusual sightings received by the editor. If you see anything you think should be noted in this column please let me know.

A Great Egret was reported from Reed Lake 11 August and was joined by a second bird 20 August. Two adult Snowy Egrets were also at Reed Lake on the 11 August. Eight Cattle Egrets were at the north end of Last Mountain Lake on 29 August, likely part of the group that summered in this area. A pair of White-faced Ibis were in the same area from mid-July to mid-September. A Little Gull was at the south end of Blackstrap Reservoir from 15 to at least 21 September. On 21 September it was joined by a Sabine's Gull. A Eurasian Widgeon was found near the Gardiner Dam and was probably there from the 26 to 28 September. A flock of 22 Wood Ducks were seen at Katepwa Dam on 28 September and a lone male was in the river by the University of Saskatchewan from at least 4 to 23 October. (Wood Ducks have successfully nested in boxes at White Bear Lake, north of Carlyle, for the last two years.) August 29 saw the first report of a male Barrow's Goldeneye, located at the north end of Last Mountain Lake. Six Surf Scoters were at the south end of this lake from early to mid-October. Condie also had a Surf Scoter on 19 October and a Mississippi Kite on 7 October. A Townsend's Solitaire was found in Regina on 5 October and another was seen in Saskatoon from 16 to 23 October. First winter Mew Gulls were seen on 9 October (3) and 25 October (1). Another tough-to-identify, maybe species, Thayer's Gull, was seen in Regina on the 22 and 25 October; again in first-winter plumage. A Black-throated Blue Warbler made a brief appearance in Saskatoon on 23 October. Another male Barrow's Goldeneye was at Regina Beach 26 October, along with 2 female Black Scoters. A single female Black Scoter was seen at Avonlea on the 29th.

The Swift Fox note by Sig Jordheim (see p. 163) is an important mammal observation from several viewpoints. It shows that these little foxes are surviving and this individual is to the north and east of the release area. The animal had to cross the river, a significant boundary.

Because extinction is forever, rare species are the focus of conservation biology. Specialists in this young scientific discipline conduct their studies with the same sense of immediacy as doctors in an emergency ward. They look for quick diagnoses and procedures that can prolong the life of a species until more leisurely remedial work is possible. *E.O. Wilson, 1992. The diversity of life. W.W. Norton and Company, New York. 424 pp.*

IN MEMORIAM

LLOYD OTIS TILFORD PETERSON, 1903-1996

W. VIC BEAULIEU, Indian Head, SK.

Lloyd Peterson died on 12 July 1996 at Indian Head. He was born in Wisconsin, 23 March 1903, son of Peter and Mathilda Peterson. In 1904 the family moved to Pathlow, Saskatchewan, and later to Bagley, north of Melfort, where Lloyd attended a country school. He completed high school in Kinistino. After completing teacher training in 1924, Lloyd taught in rural schools for three years. He received his BSc in Biology from the University of Saskatchewan in 1933 and an MSc in Entomology from the University of Minnesota in 1939.

Lloyd was employed as Insect Pest Investigator at the Dominion Entomological Laboratory, Indian Head, 1930-1939, and then as officer-in-charge from 1939-1957. In 1957, after the reorganization of forest entomology, he was transferred to the PFRA Forestry Station. He retired in 1968.

Lloyd's interest in and concern for the land and all living things developed early in life while he worked on the farm. Friendly and helpful, he wanted to share his appreciation of nature so that all might use it wisely. He was an early supporter of the *Blue Jay*. Mrs. Priestly's files contain letters from him in which he identified the insects she had sent to him in the years 1944-45. Stuart Houston remembers Lloyd's articles in the early issues of *Blue Jay*: an excellent treatment of tree and shrub insects: 6(2):21-25, Jan.-Mar. 1946 and another on the ash borer: 6(3-4):4-6, Apr.-Sept. 1948. He and W.A. Worden co-authored an extensive article, "The Cecropia Moth in the Prairie Provinces": 20(1):28-33, March 1962.

Lloyd played a part in both the Yorkton and Indian Head Natural History Societies, as well as in the Provincial Society. When the Saskatchewan Natural History Society was formed in 1949, he was named a director, a position he retained until 1955. He was particularly concerned with maintaining a strong, active membership in the provincial society. Apart from the personal benefits members would derive, Lloyd felt that there was a real need for a large, well-informed membership to influence those who make the critical decisions on the use of our natural resources. While serving as membership chairman from 1972 to 1976, he stressed the importance of personal contact. He began a campaign of writing personal letters to recently lapsed members. He circulated brochures, leaflets and sample copies of *Blue Jay* to prospective members. His effective personal touch resulted in a yearly increase in membership. In 1973, for example, membership rose by 17% from 1,069 to 1,249.

Assisted by Mary Skinner, Rose McLaughlin and Lorne Scott, Lloyd organized the 1971 Provincial Summer Meeting at Indian Head. A record 250 people attended. Because families and school children had been asked to participate, the summer meet created great interest in the Indian Head area. On October 8 1971, 18 persons met at the Peterson home and the Indian Head Natural History Society was formed. Through the efforts of Lloyd and Betty Asmore the membership grew to between 35 and 40 members and remained at that level until the early 1990s.

In 1977 Lloyd was appointed Provincial Society representative to the Fishing Lakes Special Planning Area Commission. He served until 1983, helping steer the Commission through a difficult organizational and developmental period. Thanks to his thoroughness, understanding, hard work, and quiet manner, Lloyd helped solve many problems in this early stage of development.

In his later years Lloyd continued to maintain his interest in the Natural History Society. In his eighty-fifth year he helped local children build nesting boxes for bluebirds and Wood Ducks, and platforms for Canada Geese. He loved his family and cherished his friends. Frugal in his use of all resources, he was generous with his time and talents. He wanted to share the beauty he saw in nature. Some time ago Lloyd and I were walking over the hills on his land in the Cherry and Marguerite Lakes area south of Indian Head. It was a bright, warm fall day and the colours were at their height. After climbing out of the valley to the top of a hill, Lloyd stopped, looked around him, then turned to me and said, "This is what renews my body and strengthens my spirit."

We who knew Lloyd Peterson celebrate his long life and are thankful for having known him. It was most fitting that on the evening of 15 July Lloyd's family and friends gathered in the cemetery at Indian Head. The sun was low in the sky, the air warm and still. After a brief service Lloyd's ashes were laid to rest in the shelter of an ash tree.

*Mated pair of Spread-Winged Damselflys (*Lestes *sp.)* *Hans Dommasch*

THE *BLUE JAY'S* EDITORIAL POLICY

On 2 November 1996 the Board of Directors of Nature Saskatchewan adopted the editorial policy given below. It will be used by the editor to make decisions on the content of *Blue Jay* and is published here to help potential contributors understand the society's aims in publishing this magazine. The editor welcomes any comments or suggestions you may have.

Objective of the Policy

This policy is provided to guide the editor, assistant editors and authors on the tone, content and quality of material to be published.

Objective of *Blue Jay*

The aim of *Blue Jay* is to provide information to its subscribers on all aspects of natural history, including ecology, conservation, biology and management.

Submission to *Blue Jay*

Material will be accepted for review and potential inclusion, provided that it supports the aims of Nature Saskatchewan.

Geographical Boundaries

The primary focus will be the Canadian prairie provinces of Saskatchewan, Manitoba and Alberta, along with the Northwest Territories. Material from the northern prairie states will also be encouraged. Information from outside this area may be published if it has some relationship to the prairie regions.

Content

Articles, notes and letters will be published that support the aims of Nature Saskatchewan to promote information exchange, discussion, education, conservation and protection of Canada's natural heritage. As a semi-refereed journal, we will accept scientific studies providing that a reader with little technical training can understand and appreciate the objectives and conclusion of the work. Observations and commentary will also be published provided that they are scientifically defensible and are clearly written. Submissions, like poetry and photography, will be included where these enhance a sense of understanding of nature.

When submitted material is judged to be wholly technical, authors will be asked to revise the article to be more comprehensible to the lay reader; or encouraged to submit their material to a fully refereed scientific journal.

The editor will provide guidelines for authors on style, accepted conventions and format. These guidelines will be reviewed every five years or sooner, if required.

The editor, referees and experienced *Blue Jay* authors have a responsibility to encourage new and inexperienced authors to submit their observations and to help them produce publishable material, by assisting with the style, format, scientific content and readability.

Schedules

Blue Jay will be published in March, June, September and December of each year. Material will generally be published in the order it is received. To maintain a balance of articles within each issue, the editor may retard or advance some material. Time-sensitive material will be accelerated whenever possible.

Policy Use and Changes

This policy will be used by the editor as a guide in making decisions on the style and content of *Blue Jay*. Articles outside the boundaries of this policy which, in the editor's view, may contribute to improving understanding of the natural world, will be referred to the associate editors for a majority decision before inclusion.

This policy will be reviewed at a full meeting of the Board of Nature Saskatchewan every five years, and by the editor and associate editors every year.

Incubating adult Sabine's Gull, Victoria Island, NWT *Wayne Renaud*

White Admiral photographed at Pike Lake, SK. *Juhachi Asai*

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